DOCKET

No. 07-588
Vide 07-589, 07-597

Title: Entergy Corporation, Petitioner
v.
Riverkeeper, Inc., et al.

Docketed: November 2, 2007
Lower Ct: United States Court of Appeals for the Second Circuit
Case Nos.: (04-6692ag - 04-6699ag)
Decision Date: January 25, 2007
Rehearing Denied: July 5, 2007
Questions Presented

---Date---	--------Proceedings and Orders----------
Sep 20 2007	Application (07A257) to extend the time to file a petition for a writ of certiorari from October 3, 2007 to November 2, 2007, submitted to Justice Ginsburg.
Sep 25 2007	Application (07A257) granted by Justice Ginsburg extending the time to file until November 2, 2007.
Nov 2 2007	Petition for a writ of certiorari filed. (Response due December 3, 2007)
Nov 2 2007	Appendix of Entergy Corporation filed.
Nov 20 2007	Order extending time to file response to petition to and including February 1, 2008, for all respondents.
Nov 29 2007	Waiver of right of respondent Utility Water Act Group to respond filed.
Nov 30 2007	Waiver of right of respondents PSEG Fossil LLC and PSEG Nuclear LLC to respond filed.
Dec 3 2007	Brief amicus curiae of Nuclear Energy Institute filed. VIDED.
Dec 3 2007	Brief amici curiae of Nebraska, et al. filed. VIDED.
Jan 15 2008	Order further extending time to file response to petition to and including February 29, 2008, for all respondents.
Feb 25 2008	Order further extending time to file response to petition to and including March 3, 2008, for all respondents.
Feb 29 2008	Brief of respondents Riverkeepers, Inc., et al. in opposition filed. VIDED.
Mar 3 2008	Brief of Federal Respondents in opposition filed. VIDED.
Mar 3 2008	Brief of respondents Rhode Island, et al. in opposition filed. VIDED.
Mar 18 2008	Reply of petitioner Entergy Corporation filed.
Mar 19 2008	DISTRIBUTED for Conference of April 11, 2008.
Apr 14 2008	Petition GRANTED and is consolidated with No. 07-589 and No. 07-597, limited to the following question: Whether Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the Environmental Protection

	Agency (EPA) to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures. A total of one hour is allotted for oral argument.
May 9 2008	The time within which to file the joint appendix and petitioners' briefs on the merits is extended to and including June 30, 2008. VIDED.
May 14 2008	The time within which to file respondents' briefs on the merits is extended to and including September 15, 2008. VIDED.
Jun 5 2008	The time within which to file the joint appendix and petitioners' briefs on the merits is further extended to and including July 14, 2008. VIDED.
Jun 5 2008	The time within which to file respondents' briefs on the merits is further extended to and including September 29, 2008. VIDED.
Jun 23 2008	Application (07A1032) for leave to file a consolidated petitioners brief on the merits in excess of the word limitation, submitted to Justice Ginsburg.
Jun 24 2008	Consent to the filing of amicus curiae briefs in support of either or neither party received from counsel for respondents Riverkeeper, Inc., et al. VIDED.
Jun 24 2008	Application (07A1032) denied by Justice Ginsburg.
Jun 30 2008	Consent to the filing of amicus curiae briefs in support of either or neither party received from counsel for petitioners' in case Nos. 07-588, 07-589 & 07-597. VIDED.
Jul 11 2008	Consent to the filing of amicus curiae briefs in support of either or neither party received from counsel for the State respondents. VIDED.
Jul 14 2008	Joint appendix filed (statement of costs received). VIDED.
Jul 14 2008	Brief of petitioner Entergy Corp. and petitioners PSEG Fossil LLC, et al. filed. VIDED.
Jul 14 2008	Brief of respondents Environmental Protection Agency, et al. in support of petitioners filed. VIDED.
Jul 14 2008	Brief of petitioner Utility Water Act Group filed. VIDED.
Jul 18 2008	Brief amicus curiae of National Association of Home Builders filed. VIDED.
Jul 18 2008	Brief amicus curiae of Pacific Legal Foundation filed. VIDED.
Jul 21 2008	Brief amicus curiae of Nuclear Energy Institute filed. VIDED.
Jul 21 2008	Brief amicus curiae of American Petroleum Institute filed. VIDED.
Jul 21 2008	Brief amici curiae of American Chemistry Council, et al. filed. VIDED.
Jul 21 2008	Brief amici curiae of Nebraska, et al. filed. VIDED.
Jul 21 2008	Brief amicus curiae of California Council for Environmental and Economic Balance filed.
Jul 21 2008	Brief amici curiae of AEI Center For Regulatory and Market Studies, et al. filed. VIDED.
Sep 8 2008	SET FOR ARGUMENT ON Tuesday, December 2, 2008.

Sep 12 2008	CIRCULATED.
Sep 23 2008	Motion for divided argument filed by the Solicitor General. VIDED.
Sep 29 2008	Brief of respondents State-Respondents filed. VIDED. (Distributed)
Sep 29 2008	Brief of respondents Riverkeeper, Inc., et al. filed. VIDED. (Distributed)
Sep 29 2008	Letter from counsel for respondents Riverkeeper, Inc., et al. proposing to lodge six documents from the records of the Senate Committee on Public Works related to congressional consideration of the Federal Water Pollution Control Act of 1972.
Oct 1 2008	Motion for divided argument filed by respondents Rhode Island, et al. VIDED.
Oct 1 2008	Letter of respondents Riverkeeper, Inc., et al. in support of State-Respondents motion for divided argument filed.
Oct 6 2008	Brief amici curiae of Environment America, et al. filed. VIDED. (Distributed)
Oct 6 2008	Letter requesting caption change received.
Oct 6 2008	Brief amicus curiae of OMB Watch filed.
Oct 6 2008	Brief amici curiae of Commercial Fisherman of America, et al. filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of Economists Frank Ackerman, et al. filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of Clean Air Task Force, et al. filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of National Wildlife Federation, and Sierra Club filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of Voices of the Wetlands, et al. filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of Illinois, et al. filed. VIDED. (Distributed)
Oct 6 2008	Brief amici curiae of Environmental Law Professors filed. VIDED. (Distributed)
Oct 14 2008	Motion for divided argument filed by respondents Rhode Island, et al. DENIED. VIDED.
Oct 14 2008	Motion for divided argument filed by the Solicitor General GRANTED. VIDED.
Oct 28 2008	Reply of respondent Utility Water Act Group filed. VIDED. (Distributed)
Oct 29 2008	Reply brief of respondents The Federal Parties in support of petitioners filed. VIDED. (Distributed)
Oct 29 2008	Reply of petitioners Entergy Corp., PSEG Fossil LLC, and PSEG Nuclear LLC filed. VIDED (Distributed)
Oct 29 2008	Record received from the U.S.C.A. for the Second Circuit. (3 boxes)
Nov 18 2008	The Clerk has approved respondents' proposed lodging. Lodging consisting of six documents from the National Archives, received from counsel for

respondents Riverkeeper, et al. VIDED. (Circulated).

Dec 2 2008 Argued. For Environmental Protection Agency, et al. in support of petitioners: Daryl Joseffer, Deputy Solicitor General, Department of Justice, Washington, D.C. For petitioners: Maureen E. Mahoney, Washington, D.C. For respondents: Richard J. Lazarus, Cambridge, Mass.

PETITION FOR WRIT OF CERTIORARI

Supreme Court, U.S.
FILED
07-5881 - 2007
OFFICE OF THE CLERK

No. 07-____

IN THE

Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,
v.
ENVIRONMENTAL PROTECTION AGENCY ET AL.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Second Circuit

PETITION FOR A WRIT OF CERTIORARI

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. Pearl Street
Jackson, MS 39201
(601) 969-2542

ELISE N. ZOLI
Counsel of Record
KEVIN P. MARTIN
GOODWIN PROCTER LLP
53 State Street
Boston, MA 02109
(617) 570-1000

Counsel for the Petitioner

November 2, 2007

Questions Presented

This case involves regulation under the Clean Water Act ("CWA") of the intake structures used by power plants to take in cooling water. After 30 years of regulating *new* facilities, the Environmental Protection Agency ("EPA") promulgated a regulation requiring *existing* cooling water intake structures to be retrofitted to comply with EPA's latest determination of the "best technology available for minimizing adverse environmental impact," measured in terms of the potential effects on early life stages of fish. The Second Circuit, deferring to EPA, held that EPA has authority to retrofit existing facilities. Siding with environmental petitioners and against EPA, the court also held that EPA's weighing of costs and benefits is limited to a narrow "cost-effectiveness" test. The questions presented, all of which implicate splits in circuit court authority, are:

1. Whether the CWA provides EPA authority to impose new requirements under Section 316(b) of the Act, 33 U.S.C. § 1326(b), with respect to existing cooling water intake structures?

2. Whether a court should accord *Chevron* deference to an agency's interpretation of its own statutory jurisdiction?

3. Whether Sections 301 and 316(b) of the CWA, 33 U.S.C. §§ 1301, 1326(b), limit EPA's weighing of costs and benefits only to the Second Circuit's "cost effectiveness" test?

Parties to the Proceeding

Petitioner Entergy Corp. ("Entergy") was a petitioner in the court of appeals. Utility Water Act Group, PSEG Fossil LLC, and PSEG Nuclear LLC, expected to be separate petitioners in this Court, were also petitioners in the court of appeals.

Respondents are the United States Environmental Protection Agency, a respondent in the court of appeals, and the following petitioners in the court of appeals: Riverkeeper, Inc.; Natural Resources Defense Council; Waterkeeper Alliance; Soundkeeper, Inc.; Scenic Hudson, Inc.; Save the Bay-People for Narragansett Bay; Friends of Casco Bay; American Littoral Society; Delaware Riverkeeper Network; Hackensack Riverkeeper, Inc.; New York/New Jersey Baykeeper; Santa Monica Baykeeper; San Diego Baykeeper; California Coastkeeper; Columbia Riverkeeper; Conservation Law Foundation; Surfrider Foundation; Appalachian Power Company; and Illinois Energy Association; and the States of Connecticut, Delaware, Massachusetts, New Jersey, New York, and Rhode Island.

Corporate Disclosure Statement

Entergy, a Delaware corporation, is a publicly traded company, and no publicly-held company has a 10% or greater ownership interest in Entergy.

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Petitioner Entergy respectfully seeks a writ of certiorari to the United States Court of Appeals for the Second Circuit.

Opinion Below

The opinion of the court of appeals (App. 1a–94a) is reported at 475 F.3d 83 (2d Cir. 2007).

Jurisdiction

The court of appeals entered its judgment on January 25, 2007. An order denying petitions for rehearing *en banc* was entered on July 5, 2007. An order extending the time for filing a petition for certiorari to November 2, 2007 was granted on September 25, 2007. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

Statutory Provisions Involved

This case generally involves the Clean Water Act, 33 U.S.C. § 1251 *et seq.*, and in particular concerns Section 316(b), 33 U.S.C. § 1326(b). Relevant statutory provisions are set forth in the appendix.

Statement of the Case

This case presents three questions of importance beyond the confines of the present dispute, with respect to which the opinion of the Second Circuit below is in conflict with decisions of several other courts of appeal. Unless reviewed and reversed, the Second Circuit's decision will overthrow decades of settled regulatory practice under the Clean Water Act (the "CWA" or the "Act"). It will also impose upon the nation's electric-generating sector a regime of potentially continuous retrofitting of power plants, costing—by EPA's reckoning—billions of dollars each

year, even where such retrofitting cannot be shown, in the case of a particular plant, to provide any environmental benefits.

The case concerns the infrastructure used by power plants, including nuclear plants, to bring surface water into their facilities. Such water is necessary to offset the heat created by power generation, thereby permitting the safe operation of such plants. The means by which cooling water is drawn into, and circulated through, a plant is a fundamental factor in plant design, and the amount of cooling water a power plant can utilize necessarily affects the amount of power a plant can generate.[1]

While cooling water is necessary for plant operation, the intake structure through which water is drawn may pose a risk of mortality to early life stages of fish through "entrainment" (passage of juvenile fish or larvae through the intake structure) and "impingement" (contact by fish with the screens or exterior of the intake structure).

To address these potential impacts from the intake of cooling water, Congress, in Section 316(b) of the CWA, authorized EPA (and delegated state authorities) to regulate the "location, design, construction, and capacity of cooling water intake structures," to ensure that such structures "reflect the best technology available for minimizing adverse environmental impact," or "BTA." 33 U.S.C. § 1326(b).

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[1] Broadly speaking, some electric-generating facilities draw in water, circulate it once through the plant, and then release it back into the environment ("once-through cooling"); other plants draw water and then consume it through cooling towers ("closed-cycle cooling").

In its decision below, the Second Circuit interpreted Section 316(b) and other provisions of the CWA in a manner inconsistent with the plain meaning of the Act and in conflict with other circuit courts on numerous issues. First, the court interpreted Section 316(b) to create a regime under which regulators must select as BTA the technology that is most effective—even by a single fish larvae—at reducing impingement and entrainment, unless the cost of that technology either cannot be reasonably borne by the electric generating sector as a whole, or a substitute technology, capable of achieving at least one identical result, is available at a "markedly lower" cost. Other than in this limited manner, EPA is entirely forbidden from inquiring whether the environmental benefits of the selected BTA are outweighed by its costs. In so holding, the Second Circuit also interpreted a separate provision of the CWA applicable to all industry, Section 301, as similarly restraining EPA's authority to weigh costs and benefits in regulating the discharge of pollutants.

Second, the court deferred to EPA's interpretation of Section 316(b) as permitting regulators to revisit their preconstruction approvals of power plants' cooling water intake structures. Under this holding such facilities are in perpetual risk of being required to retrofit fundamental plant infrastructure constructed in reliance on initial regulatory approvals. In validating this portion of its opinion and reconciling it with the remainder of the Act, the Second Circuit interpreted the CWA's pollutant "discharge" permitting provision to permit regulation of the "intake" of ambient water. In combination with the Second Circuit's restrictive reading of what constitutes BTA, the holding below creates a regime

under which the nation's existing electric supply may be forced to shut down during lengthy retrofits—costing hundreds of millions or even billions of dollars for nuclear facilities—with no assurance that EPA will not force another round of retrofits if the agency concludes it would guaranty the survival of a single additional fish egg or larvae.

The Second Circuit's decision is wrong as a matter of law, rests on a flawed understanding of this Court's pre-*Chevron* precedent,[2] and conflicts with the decisions of other courts of appeal on several issues, including: Whether regulators have authority under Section 402 of the CWA to regulate cooling water intake structures and the intake of water; whether a court should defer to an agency's interpretation of its own statutory authority; and the meaning of BTA under Section 316(b) and the term "best available technology" ("BAT") under Section 301. For the reasons given herein, this Court should grant the writ of certiorari to review and reverse the decision below.

A. Statutory Background

This case centers around the interpretation of Section 316 of the CWA, "Thermal Discharges," and in particular Section 316(b), "Cooling Water Intake Structures."

Section 316, uniquely within the CWA, targets power plants and aquatic ecosystems, for the most part *limiting* EPA's authority to impose restrictions on the former for the benefit of the latter. Section 316(a) requires EPA to relax otherwise applicable

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[2] See *Chevron U.S.A., Inc.* v. *Natural Res. Def. Council*, 467 U.S. 837 (1984).

thermal discharge requirements if the discharger demonstrates that a proposed relaxed requirement "will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife." Section 316(c), meanwhile, prohibits regulators from imposing new thermal discharge requirements on previously modified facilities for the shorter of either 10 years or until the cost of the modification is amortized or depreciated. 33 U.S.C. § 1326(a), (c).

Between these two subsections concerning the "protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife" is sandwiched the single sentence of Section 316(b), which provides, in full:

> Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

33 U.S.C. § 1326(b). The CWA says nothing about how EPA is to consider costs in selecting BTA under Section 316(b).

The sections of the Act cross-referenced by the Section 316(b)—Sections 301 and 306—do not address the intake of water. Instead, both govern the discharge of pollutants. Section 301 requires EPA to establish pollutant-specific effluent limitations that "shall be applied to *all* point sources of discharge of pollutants," whether existing or new. See 33 U.S.C. § 1311(e). Section 306 required EPA to begin a rolling process of issuing "standards of

performance" exclusively for new point sources of pollution on a category by category basis, with the standards of performance applied to new facilities "the construction of which is commenced after the publication of proposed regulations * * * which will be applicable to such source." See 33 U.S.C. § 1316.

Sections 301 and 306 contribute to the CWA's alphabet soup of technological standards. Section 301 initially called for "the application of the best practicable control technology currently available" ("BPT"), but required, by March 31, 1989, the implementation of a "best available technology economically achievable" standard ("BAT"). 33 U.S.C. §§ 1311(b)(1)(A), (b)(2)(A). Section 306, meanwhile, requires standards of performance to be set under a "best available demonstrated control technology" standard, or "BADCT." 33 U.S.C. § 1316(a)(1).

Both Sections 301 and 306 expressly incorporate Section 304, in which Congress provided *some* guidance on how regulators may consider the cost and benefits of compliance in selecting one or another technology. Section 304 of the Act provides that, in selecting BPT under Section 301, EPA should consider "the total cost of application of technology in relation to the effluent reduction benefits to be achieved by such application," while in selecting the more stringent BAT, the agency must still consider "the cost of achieving such effluent reduction * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. §§ 1314(b)(1)(B), (b)(2)(B). Section 306 states that, in selecting BADCT, EPA is required to consider "the cost of achieving * * * effluent reduction, and any

non-water quality environmental impact and energy requirements." 33 U.S.C. § 1316(b)(1)(B).

Under Section 401 of the CWA, proposed facilities requiring a federal license must obtain a *pre*construction certificate that "shall set forth any effluent limitations *and other limitations*" specific to the facility, including, where appropriate, facility-specific requirements under Section 316(b). See 33 U.S.C. § 1341 (emphasis added). Section 402 of the Act further provides that operating facilities must obtain, subject to renewal every five years, a National Pollutant Discharge Elimination System ("NPDES") permit with respect to the "discharge of any pollutant," which may contain different discharge limitations than found in the preconstruction Section 401 permit. See 33 U.S.C. § 1342(a)(1). Unlike Section 401, however, Section 402 refers only and specifically to "discharges," *not* to "other limitations."

B. Environmental Protection Agency Rulemaking

EPA's initial attempt at implementing Section 316(b) was abandoned following procedural missteps. See *Appalachian Power Co.* v. *EPA*, 566 F.2d 451, 457 (4th Cir. 1977); 44 Fed. Reg. 32956 (June 7, 1979). EPA did not go gently back to the drawing board. Rather, for nearly thirty years, EPA addressed potential impacts on fish attributable to new power plants by making preconstruction BTA determinations on a site-specific basis. Power plants then were constructed with the approved cooling water intake structures, which determined the design of, and that were integrated with, the hearts of the plants.

The rulemaking at issue here has its origin in a consent decree between EPA and environmental groups requiring the issuance of regulations implementing Section 316(b). The rulemaking was conducted in three phases. In Phase I, EPA set forth standards for cooling water intake structures at new steam-electric generating facilities, and in Phase III, EPA promulgated regulations for new industrial facilities, as well as certain existing industrial and steam-electric generating facilities below a threshold size of cooling water use (among other factors).

At issue in this case is the Phase II rulemaking, which concerns existing electric-generating facilities above the threshold size. See 69 Fed. Reg. 41576 (July 9, 2004), codified at 40 C.F.R. Part 125, Subpart J (the "Rule") (App. 122a–593a). The Rule is targeted exclusively at the reduction in assumed mortality of aquatic organisms through entrainment and impingement, under the assumption that offsetting assumed mortality from those causes may assist aquatic populations taxed by over-fishing. See *id.* at 41590 (App. 188a).

EPA crafted the Rule to require "technology that is technically available, economically practicable, and cost-effective while at the same time authorizing a range of technologies that achieve comparable reductions in adverse environmental impact." 69 Fed. Reg. at 41583 (App. 157a–158a). To evaluate the costs and benefits of the Rule, EPA developed facility-specific estimates of the costs, along with estimated benefits to, *e.g.*, commercial and recreational fishermen. See *id.* at 41648–55, 41655–64 (App. 439a–515a). These analyses were supported by voluminous technical documents setting forth EPA's methodologies and estimated

costs and benefits of the Rule. See *id.* at 41577 (App. 127a).

In formulating the Rule, EPA rejected as BTA a requirement that all existing facilities replace their cooling systems (not just their intake structures) with closed-cycle cooling, *i.e.*, cooling towers. Cf. *supra*, 2 & n. 1. EPA reasoned, *inter alia*, that: (a) closed-cycle cooling, with a total social cost conservatively estimated at about $3.5 billion annually, "is not the most cost-effective approach for many existing facilities"; (b) decreased energy production associated with retrofits would necessitate the construction of 20 new power plants; (c) a cooling-tower mandate would increase fossil fuel consumption, with resulting air-quality impacts from those new plants; (d) inadequate data existed on cooling-system conversions at existing facilities; and (e) non-water quality impacts, such as water loss, icing, fogging and noise, would be associated with closed-cycle cooling. 69 Fed. Reg. at 41605–06 (App. 255a–60a).

Instead of selecting a single technology as BTA for use in all facilities, EPA designated a suite of technologies, including, *inter alia*, fine- and wide-mesh screens, aquatic filter barrier systems, barrier nets, and fish return systems. 69 Fed. Reg. at 41599 (App. 228a). The Rule requires the use of technology to reduce entrainment by 60 to 90% from a defined baseline condition, and impingement mortality by 80 to 95% from the same baseline. See 40 C.F.R. § 125.94(b)(1), (2). EPA also provided a variance from these requirements for facilities where the costs of achieving the performance standards are significantly greater than, *inter alia*, the fisheries benefits of compliance. See *id.*, § 125.94.

C. The Second Circuit's Decision

EPA's rule was challenged in petitions filed under 33 U.S.C. § 1369(b) by environmental, State, and industry petitioners, with the challenges consolidated before the Second Circuit.

1. In its petition, Entergy argued that Congress did not intend Section 316(b) to apply to existing facilities. In particular, Entergy contended that the integrated phrase "location, design, construction, and capacity" limit the section's application solely to new facilities, *i.e.*, facilities that have not yet been located, designed, constructed or sized with respect to their intake structures. Entergy further argued that this reading of Section 316(b) is supported by the structure of the CWA: The Act provides no continuing mechanism for imposing new requirements on existing cooling water intake structures, since the NPDES permitting system—through which the other requirements of the CWA are amended for existing facilities—only pertains to the regulation of "discharges" of pollutants.

The Second Circuit found Entergy's plain language argument "superficially appealing," App. 63a, and its argument that Section 316(b) requirements have no place in NPDES discharge permits "a closer question." App. 75a. Nevertheless, brushing aside the absence of any clear authority in the Act for regulating existing cooling water intake structures as a mere "textual hiccup," see *ibid.*, the Second Circuit ultimately rejected Entergy's arguments by deferring to EPA on the scope of its authority. See *id.* 77a. The court adopted EPA's assertion of jurisdiction, based largely on 316(b)'s cross-reference to Section 301 of the Act, which allows EPA to regulate discharges from new and

existing facilities. See *id.* 76a–77a. It also concluded that EPA could impose new Section 316(b) requirements on existing facilities via NPDES permits. See *id.* 75a–76a ("EPA's decision to use the NPDES process to enforce section 316(b) is not unreasonable.").

2. Ruling in favor of the Environmental and State petitioners, the Second Circuit also rejected EPA's designation of a suite of technologies—not closed-cycle cooling—as BTA. The court held that the plain language of Section 316(b), in the context of the CWA, requires EPA to select as BTA the one technology most effective at reducing impingement or entrainment, unless (1) that "benchmark" technology is not affordable to the industry as a whole, or (2) use of another technology is justified under a "cost-effectiveness test." Accusing EPA of inappropriately considering costs and benefits in a different manner (characterized by the court as "cost-benefit analysis"), the court remanded for EPA to apply the court's own standard.

In detailing the mechanics of its novel "cost-effectiveness" test, the Second Circuit initially suggested that the new test permits substitution of a less expensive technology that "achieves essentially the same results as the benchmark" technology. App. 26a. The court, however, then went on to demonstrate its test, confirming that the substitute technology must in fact be capable of achieving, in at least some cases, an identical result as the benchmark technology:

> Assuming the EPA has determined that power plants governed by the Phase II rule can reasonably bear the price of technology that saves between 100–105 fish, the EPA, given a

> choice between a technology that costs $100 to save 99–101 fish and one that costs $150 to save 100–103 fish (with all other considerations, like energy production or efficiency, being equal), could appropriately choose the cheaper technology on cost-effectiveness grounds.
>
> * * *
>
> [T]he EPA could not choose the cheaper technology on cost considerations under section 316(b) if the EPA had first determined that the power plants could reasonably bear the cost of technology that could save at least 102 fish.

App. 27a–28a.

In interpreting Section 316(b) to permit only this cost-effectiveness test, the Second Circuit conceded that "Section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that EPA must consider in determining BTA." See App. 20a; see also *id.*, 23a (same). The court, however, reached its holding in reliance on two principal factors. First, the Second Circuit invoked this Court's pre-*Chevron* decision in *Am. Textile Mfrs. Inst., Inc.* v. *Donovan*, 452 U.S. 490, 510 (1981), on which the court relied for the proposition that "[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute." App. 25a. The court also relied upon the purported "linguistically similar" wording of Section 316(b)'s BTA standard compared with Section 301's BAT standard, concluding that because—in the Second Circuit's understanding—cost-benefit

analysis is forbidden under the BAT standard, it must be forbidden for BTA as well. See *id.*, 23a

Bypassing what it acknowledged as EPA's general authority to issue variances, the court also intuited a plain meaning in the Act barring EPA from instituting the Rule's site-specific variance program based on a weighing of costs and benefits. In rejecting this particular provision, the court rationalized that the plain language of Section 316(b) does not permit consideration of "the degraded quality of waterways in selecting a site-specific BTA," *i.e.*, the fact that no fish live in a particular body of water is irrelevant to whether BTA must be implemented at a facility drawing water from that source. See App. 58a.

Reasons for Granting the Petition

This case presents three important questions for this Court's review, each of which implicates a split in authority among the courts of appeal, and each of which has implications beyond the case at hand.

First is the question whether EPA has authority, under Section 316(b), to compel the retrofitting of existing cooling water intake structures, a process that would be disruptive of the nation's electric supply and that could cost billions of dollars annually. The Second Circuit, pointing to the NPDES program, found that the agency does have such authority, and in doing so placed itself squarely into conflict with both the DC and Fourth Circuits. Those courts of appeal previously had held, respectively, that the NPDES permitting system applies only to "effluent," *i.e.*, discharge limitations, and that Section 316(b) regulations are not discharge limitations. If not reviewed and reversed, the Second

Circuit's decision will extend EPA authority to a panoply of activities not authorized, or even contemplated, by Congress.

Second, the court of appeals explicitly deferred to EPA on the scope of the agency's own authority. This deference implicates a robust split among multiple circuits on the question whether agency assertions of jurisdiction are entitled to deference, with three other courts of appeal holding, as did the Second Circuit, that such deference is warranted, and at least two courts of appeal holding that it is not.

The third question presented by this case is whether EPA's discretion to weigh costs and benefits in selecting BTA under Section 316(b) is limited to the Second Circuit's rigidly defined, and wholly manufactured, "cost effectiveness" test. The court's refusal to allow EPA to weigh costs and benefits in any other fashion is in direct conflict with the previously authoritative interpretation of Section 316(b) by the First Circuit. Furthermore, the Second Circuit reached its reading of Section 316(b) in part by concluding that EPA's discretion in selecting BAT under Section 301 of the CWA is similarly constrained. That interpretation of Section 301 is squarely in conflict with the Sixth Circuit's reading of the section, inconsistent with other circuit courts' reading of the section, and incongruent with the reading by other courts of similar language in other environmental statutes. The Second Circuit's holding on this question should be reviewed and reversed to preserve the previously settled understanding of EPA's discretion to weigh costs and benefits under both Sections 316(b) and 301 of the Act.

A. The Second Circuit's Holding that EPA Has Authority under Section 402 to Impose Section 316(b) Regulations on Existing Facilities Conflicts with the Decisions of Two Other Circuit Courts of Appeal

The Court should take this case to review the Second Circuit's erroneous conclusion that Section 316(b) allows EPA to require the retrofitting of existing cooling water intake structures. The Second Circuit's reading of Section 316(b) runs counter to Congress's clear intent, is in conflict with decisions from two other courts of appeal, and threatens the stability of the nation's supply of electricity.

1. Nothing in the text of the CWA reasonably can be read to authorize EPA to require the retrofitting of existing cooling water intake structures.

As an initial matter, the plain meaning of Section 316(b) itself limits its application to cooling water intake structures that have yet to be built. This is seen in the Section's reference to "the *location, design, construction, and capacity* of cooling water intake structures." 33 U.S.C. § 1326(b) (emphasis added). The ordinary meaning of this phrase—held together with the conjunction "and"—limits application of Section 316(b) to prospective equipment, *i.e.*, those intake structures not yet constructed, designed, located, and sized to a particular capacity, and does not make sense when applied to existing structures. See, *e.g.*, Black's Law Dictionary (6th ed. 1990) ("Construction" means "the creation of something new, as distinguished from the

repair or improvement of something already existing").[3]

There are many ways Congress could have expressed an intent to mandate perpetual retrofitting of major power plant infrastructure. Congress might have omitted the Act's specific reference to the "location, design, construction, and capacity" of cooling water intake structures and instead simply provided that EPA "shall require that cooling water intake structures reflect the best technology available." The Second Circuit, however, cannot attain such a reading of the Act by applying a "blue pencil" to the statute as written. *Addison* v. *Holly Hill Fruit Prods., Inc.*, 322 U.S. 607, 617 (1944).

In concluding that Section 316(b) applies to existing facilities, the Second Circuit relied, in part, on Section 316(b)'s cross-reference to Section 301. Section 301, as the Second Circuit noted, does apply to existing facilities. That, however, is only because Section 301 allows EPA to regulate "*all* point sources of discharge of pollutants" including newly constructed facilities not within a category subject to a more stringent standard of performance under Section 306. See 33 U.S.C. § 1311(e) (emphasis

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[3] Definitions of the other statutory terms are to similar effect. See, *e.g.*, Black's Law Dictionary (6th ed. 1990) ("Design" means "the plan or scheme conceived in mind and intended for *subsequent execution*.") (emphasis added); Oxford English Dictionary (2d ed. 1989) ("Design" means "a plan or scheme conceived in the mind and intended for *subsequent execution*; the preliminary conception of an idea that is to be carried into effect by action; a project.") (emphasis added); American Heritage Dictionary (3d ed. 1992) ("Location" means "the act or process of locating.").

added). Given the language of Section 316(b) itself, the most natural reading of Section 316(b)'s cross reference to both Sections 301 and 306 is that Congress intended Section 316(b) requirements to be applied to all new facilities, irrespective of whether a given facility's discharges happen to be regulated primarily under Section 301 or Section 306.

2. That Section 316(b) does not provide EPA authority to require the retrofitting of existing cooling water intake structures is confirmed by the absence of any CWA mechanism for imposing new requirements relating to the intake of water on existing facilities. While the Second Circuit ultimately deferred to EPA's argument that such authority does exist, that conclusion conflicts with earlier decisions from both the D.C. Circuit and the Fourth Circuit.

EPA and the Second Circuit purport to find authority for EPA to impose new requirements on existing cooling water intake structures in the NPDES permitting process of Section 402 of the Act, which requires existing facilities to apply to receive a discharge permit every five years. The limited scope of the NPDES program, however, is evident from the plain language of the Act. Section 402 of the Act, which establishes the NPDES program, states in pertinent part that:

> [t]he Administrator may, after opportunity for public hearing, issue a permit for the *discharge of any pollutant, or combination of pollutants*, notwithstanding section 1311(a) of this title, upon condition that *such discharge* will meet either (A) all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or (B) prior

> to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.

33 U.S.C. § 1342(a)(1) (emphases added). No reference to Section 316(b), 33 U.S.C. § 1326(b), is made in Section 402. Further, no reasonable analysis of its language allows a requirement related to the intake of water under Section 316(b) to be transformed into a requirement relating to the "discharge of any pollutant, or combination of pollutants." This is confirmed by the Section 401 preconstruction permitting process's broader reference to "effluent limitations *and other limitations*," including, where appropriate, Section 316(b) limitations. See 33 U.S.C. § 1341(d) (emphasis added); see also *supra* at 6–7. If Congress intended NPDES permits to cover more than limitations pertaining to "discharges," it knew how to say so.

The Second Circuit dismissed the permitting process's limitation to "discharge" requirements as a mere "textual hiccup." See App. 75a. In glossing over the plain language of the Act, however, the Second Circuit placed itself into conflict with two other courts of appeal.

First, in *Va. Elec. & Power Co.* v. *Costle*, 566 F.2d 446 (4th Cir. 1977), the Fourth Circuit considered whether it possessed jurisdiction to hear appeals from an EPA rulemaking promulgating regulations under Section 316(b), an issue which required the court to consider, *inter alia*, whether Section 316(b) regulations are "effluent limitations" or "other

limitations." In concluding that they are not "effluent limitations," the court explained:

> No contention is raised that the § 316(b) regulations are themselves effluent limitations. *It is obvious that they are not*, for the statute defines "effluent limitation" as any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters. * * * *The regulations involved here are concerned with structures used to withdraw water for cooling purposes, not the discharge of pollutants into the water.*

Id. at 449 (emphases added).

Second, in *Natural Res. Def. Council* v. *EPA*, 859 F.2d 156 (D.C. Cir. 1988), the D.C. Circuit considered challenges to EPA's issuance of regulations governing the NPDES permitting process. Industry petitioners challenged EPA's attempt to implement requirements unrelated to "water quality" through NPDES permits. The D.C. Circuit sided with petitioners, rejecting an argument by EPA that the agency can use NPDES permits "to impose permit conditions *unrelated to effluents*," *i.e.*, discharges. *Id.* at 170 (emphasis added).

Thus, the courts of appeal are divided on the question whether Section 316(b) requirements can be implemented through the NPDES permitting process of Section 402. On the one hand, the Fourth Circuit has concluded that Section 316(b) regulations are not effluent limitations, and the DC Circuit has held that only effluent limitations may be imposed through

NPDES permits. On the other hand, the Second and, arguably, Seventh Circuits have held that NPDES permits can be used to impose Section 316(b) intake requirements on existing facilities.[4] Whether EPA has authority to impose non-effluent requirements, including Section 316(b) requirements, under Section 402 is a matter of broad import, implicating the very purpose and scope of the CWA, and should be reviewed and answered by this Court.

3. The Second Circuit's conclusion that EPA has authority to require the retrofitting of existing cooling water infrastructure is not only incorrect as a matter of law, it poses significant risks to the nation's electric supply. Retrofitting the cooling systems of existing facilities is no simple or inexpensive proposition. With respect to nuclear facilities, EPA concluded that retrofitting with cooling towers, if possible at all, would be a long process of several years, with at least ten months during which the facilities that currently power American homes and businesses could produce no electricity, and after which the retrofits would precipitate compromised electric-system reliability, escalating electricity prices and increases in harmful air emissions. See 69 Fed. Reg. at 41605–07 (App. 254a–263a). EPA conceded that annual costs of the Rule, in excess of potential benefits, could exceed $3.5 billion annually. *See id.* at 41605 (App. 256a).

These serious health, safety and economic impacts not only underscore the need for this Court's review, but confirm the flaws in the Second Circuit's

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[4] See *U.S. Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977), abandoned on other grounds, *W. Chicago v. NRC*, 701 F.2d 632 (7th Cir. 1983).

interpretation of the Act. Section 316 embodies Congress's concern that the protection of fish not impose unreasonable costs on the electric-generating sector and, correspondingly, the essential service those facilities provide. Congress specifically added Sections 316(a) and 316(c) to allow power plants to employ alternative, less stringent thermal limits, if those discharges nonetheless protect a balanced indigenous fish community. See *supra* at 4–5. It beggars belief that Congress, so careful to restrain EPA's hand with respect to thermal discharges, contemplated the retrofitting of the intake structures of that same sector over the very same aquatic impacts.

As this Court has cautioned, Congress "does not * * * hide elephants in mouse holes." *Whitman* v. *American Trucking Ass'ns, Inc.*, 531 U.S. 457, 468 (2001). If Congress intended to impose on the electric-generating sector a perpetual retrofitting regime, it would have done so more clearly than through a provision limiting EPA's authority to regulating the "location, design, construction, and capacity of cooling water intake structures," or through a licensing provision directed to "the discharge of any pollutant." The Court should take this case to resolve the split among the courts of appeal over EPA's authority through the NPDES permitting program to require retrofitting of power plants for anything other than pollutant-discharge requirements, particularly requirements under Section 316(b).

B. The Second Circuit's Deference to EPA on the Existing Facilities Issue Implicates a Split Among the Courts of Appeal Over Deference to Agency Assertions of Jurisdiction

1. As described above, while the Second Circuit disagreed with Petitioner that the plain language of the Act deprives EPA of jurisdiction to require the retrofitting of existing cooling water intake structures, it did find some ambiguity—*i.e.*, the "textual hiccup"—on this point. The court ultimately concluded that it would defer to EPA's assumption of authority over existing structures. App. 72a ("We conclude * * * that, at the very least, the EPA permissibly interpreted the statute to cover existing facilities and that its interpretation is therefore entitled to deference under *Chevron*"). In deferring to EPA's determination of its own jurisdiction over existing facilities, the Second Circuit placed itself in the middle of a well-developed circuit split on the appropriate level of deference to agencies making determinations of the scope of their own jurisdiction.

2. For decades, this Court's precedent had suggested that courts should not grant agencies deference on the subject of agency jurisdiction. In *Addison* v. *Holly Hill Fruit Prods., Inc.*, 322 U.S. 607, 608 (1944), this Court considered the validity of a regulation passed pursuant to the Fair Labor Standards Act. The Act exempted employees "within the area of production (as defined by the Administrator), engaged in * * * canning of agricultural * * * commodities for market" from certain regulation *Id.* (citing 29 U.S.C. § 210(a)(10)). The Administrator issued a regulation defining "area of production" to include those employees (1) engaged

in canning of goods that were obtained by farms in the immediate locality of the place of employment, and (2) who are employed at an establishment with no more than seven employees. *Id.* at 609–10.

The Court struck down the regulation, holding that the Administrator's attempt to regulate some workers engaged in the canning of agricultural commodities (those at establishments employing more than seven employees) exceeded its authority under the Act. *Id.* at 616–19. In refusing to defer to the Administrator's interpretation of "area of production," the Court explained that "[t]he determination of the extent of authority given to a delegated agency by Congress is not left for the decision of him in whom authority is vested." *Id.* at 616.

However, in *NLRB* v. *City Disposal Sys., Inc.*, 465 U.S. 822 (1984), decided earlier in October Term 1983 than *Chevron*, the Court rejected the argument that it should not defer to NLRB's determination that certain labor conduct came within the scope of "concerned activities" protected under the National Labor Relations Act. The respondent in that case had argued that no deference should be granted, because such a determination was "essentially a jurisdictional or legal question concerning the coverage of the Act." *Id.* at 830 n. 7. This Court stated, without citing *Addison*, that it had "never * * * held that such an exception exists to the normal standard of review of Board interpretations of the Act." *Ibid.*

The tension between *Addison* and *City Disposal* has not, since *Chevron*, been conclusively resolved by the Court. The issue, however, has been addressed by individual justices, most notably in *Mississippi*

Power & Light Co. v. *Mississippi*, 487 U.S. 354 (1988). In his concurrence in that case, Justice Scalia stated that "it is settled law that the rule of deference applies even to an agency's interpretation of its own statutory authority or jurisdiction." *Id.* at 381. A three-Justice dissent, on the other hand, contended that "we cannot presume that Congress implicitly intended an agency to fill 'gaps' in a statute confining the agency's jurisdiction, since by its nature such a statute manifests an unwillingness to give the agency the freedom to define the scope of its own power." *Id.* at 387.

3. The lack of definitive guidance from this Court has led the circuit courts to adopt conflicting rules. See *Newton v. FAA*, 457 F.3d 1133, 1137 (10th Cir. 2006) (noting that "the extent to which such deference should be accorded to an agency's interpretation of its own jurisdictional statute has been a matter of dispute"). The Third, Fourth, and Fifth Circuits, like the Second in the instant case, have deferred to an agency determination of its own jurisdiction. See, *e.g.*, *E.E.O.C.* v. *Seafarer's Int'l Union*, 394 F.3d 197, 201 (4th Cir. 2005); *First Gibraltar Bank, FSB* v. *Morales*, 42 F.3d 895, 901 (5th Cir. 1995); *Puerto Rico Mar. Shipping Auth.* v. *Valley Freight Systs., Inc.*, 856 F.2d 546, 552 (3rd Cir. 1988).

Other circuit courts, however, since *Chevron* and also since *Mississippi Power & Light*, have refused to apply deference—Petitioner believes correctly—to an agency's view of its own jurisdiction. This no-deference rule has been repeatedly employed in both the Seventh and Federal Circuits, see, *e.g.*, *Holderfield* v. *Merit Sys. Prot. Bd.*, 326 F.3d 1207, 1208 (Fed. Cir. 2003), *Northern Illinois Steel Supply*

Co. v. *Secretary of Labor*, 294 F.3d 844, 846–47 (7th Cir. 2002), and has also found some support in the D.C. Circuit, see *Business Roundtable* v. *SEC*, 905 F.2d 406, 408 (D.C. Cir. 1990); *ACLU* v. *FCC*, 823 F.2d 1554, 1567 n.32 (D.C. Cir. 1987).

The question whether agencies should be accorded deference with respect to determinations of their own jurisdiction is an important one even beyond the context of this case and is squarely presented by the decision below. The Court should take the case to resolve that issue in a manner consistent with its earlier decision in *Addison* and the approach adopted by the Seventh and Federal, Circuits.

C. The Second Circuit's Holding Limiting EPA to a Narrow "Cost-Effectiveness" Test under Sections 301 and 316(b) Conflicts with the Holdings of Other Courts of Appeal

The Second Circuit erred not only in holding that EPA has authority to require the retrofitting of existing cooling water intake structures, but also in holding that, in selecting BTA, EPA can only employ the cramped "cost-effectiveness" test made up that court. As with the court's decision on EPA's authority, this decision is incorrect as a matter of law, conflicts with earlier holdings of other courts of appeal, and should be reviewed, and reversed, by this Court.

1. The Second Circuit's suggestion that Section 316(b) has a plain meaning requiring that court's cost-effectiveness test is wholly unfounded. Section 316(b) does not expressly or implicitly provide a standard requiring technology that would save 101–

103 fish for $150, unless another technology would save 99–101 fish for $100, unless the industry as a whole could "reasonably bear" a technology saving 102 fish. See *supra* at 11–12. If anything, the Second Circuit's awkward grappling with how to save a single additional fish reveals not a plain meaning in Section 316(b), but the wisdom of deferring to agency expertise on the highly technical question of BTA selection. Indeed, the Second Circuit's failure to defer to EPA on this technical question is even more striking given the court's deference to EPA on the scope of its jurisdiction, an assuredly non-technical question.

In a world of finite resources on which competing demands are placed, consideration of what is "best" necessarily includes a weighing of factors broader than the Second Circuit's "cost effectiveness" test allows. The court's conclusion that BTA is the technology that saves 102 fish, instead of 99–101 fish, so long as it does not bankrupt the industry, disregards the plain fact that electricity is an essential service, not to mention the sensible possibility that the money spent saving that extra fish might someday be needed for other purposes, *e.g.*, ensuring the reliability of the nation's electricity supply. Clearly, the "best" technology is not necessarily that which leaves industry unduly financially burdened. The decision below underscores the judiciary's unsuitability to manage these highly technical and policy-laden trade-offs in any kind of systematic fashion.

2. Unsurprisingly, the Second Circuit's strained plain-meaning interpretation of Section 316(b) conflicts with the reading given that Section by the only other circuit court to have directly considered

the issue in the past 35 years. In 1979, during the Act's early implementation, the First Circuit considered a challenge by environmental petitioners to EPA's approval of the location and design of a then-proposed cooling water intake structure at the Seabrook nuclear facility in New Hampshire. See *Seacoast Anti-Pollution League* v. *Costle*, 597 F.2d 306 (1st Cir. 1979). In rejecting the challenge, the First Circuit explained:

> The Administrator decided that moving the intake further offshore might further minimize the entrainment of some plankton, but only slightly, and the costs would be "wholly disproportionate to any environmental benefit." * * * Petitioners, wisely, do not argue that the cost may not be considered, and no harm is done by noting that there would be other costs. The legislative history clearly makes cost an acceptable consideration in determining whether the intake design "reflect(s) the best technology available."

Id. at 311 (citation omitted).

What the First Circuit, relatively soon after passage of the Act, considered a "wise" reading of the Act, the Second Circuit, decades later, has deemed a forbidden reading. Clearly one court is not right, and this Court should grant review to resolve the split.

3. The Second Circuit buttressed its reading of Section 316(b) by resorting to Sections 301 and 306. The court concluded that the "best technology available" language in Section 316(b) is "linguistically similar" to the "best available technology" language of Section 301(b)(2)(A), and held that, because a weighing of costs and benefits is

not permitted with respect to BAT, neither is it permitted with respect to BTA. App. 23a.

This analysis based on Section 301 misreads the statutory text. As an initial matter, the Second Circuit's analysis ignores the fact that it is not Section 301(b)(2)(A), but Section 304, that governs consideration of costs and benefits in determining BAT. See *supra* at 6. The interplay of Section 301 and Section 304 demonstrates that the word combination "best," "available," and "technology" does not itself dictate how EPA may consider costs and benefits. If it did, the pertinent language in Section 304 would be mere surplusage, and it is axiomatic that every word in a statute must be read to have some meaning. See *Dunn* v. *Commodity Futures Trading Comm'n*, 519 U.S. 465, 472 (1997).

Moreover, in finding that Section 301 prohibited any weighing of costs and benefits in determining BAT, the Second Circuit based its conclusion principally on the structure and purpose of Section 301 as initially passed in 1972. According to the Second Circuit, the Act envisions a shift from a BPT standard, under which a weighing of costs and benefits is permitted, to a BAT standard, under which such weighing is forbidden. See App. 20a–22a. Congress, however, changed that structure in 1977 precisely to avoid the result the Second Circuit mandates here.

While under the 1972 Act Section 301 treated all effluents alike, the 1977 amendments created a three-tiered regulatory system. First, Congress lowered the control requirement for all "conventional pollutants," namely those that EPA concluded were adequately regulated under the 1972 Act given projected expenditures for additional control

technology, from BAT to "best conventional pollutant control technology." See 33 U.S.C. § 1311(b)(2)(E). Second, the amendments retained the BAT standard for toxic chemicals not implicated here. *Id.* § 1311(b)(2)(C). Finally, and importantly, while Congress retained BAT for the third tier of "nonconventional pollutants," the amendments created a waiver provision based expressly on a consideration of environmental benefit. *Id.* §§ 1311(b)(2)(F); 1311(g).

Viewed in light of the 1977 amendments, it is clear that the Second Circuit's reliance on the supposedly tightening standards of the Act leading up to implementation of the BTA standard does not support the holding below. Under the 1977 Amendments, standards were actually *relaxed* for all but the most dangerous toxic chemicals released into the water, a change enacted for the very purpose of avoiding uneconomic regulation of the sort mandated by the Second Circuit's decision.

4. In addition to misconstruing the actual text of the CWA, the Second Circuit misconstrued precedent from this Court, and in doing so placed itself into conflict with numerous other courts of appeal.

To buttress its holding, the Second Circuit relied upon *dicta* in this Court's decision in *EPA* v. *National Crushed Stone Ass'n*, 449 U.S. 64 (1980), which the circuit court found "strongly suggests" that a weighing of costs and benefits "is no longer permitted" in determining BAT, and hence (in the Second Circuit's view) BTA. App 23a. The language relied upon by the circuit court is found in the *National Crushed Stone* decision's background section; this Court noted, after describing the factors used by EPA in determining BPT, that "[s]imilar

directions are given the Administrator for determining effluent reductions attainable from the BAT except that in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits." 449 U.S. at 71. To reach its holding in the case, however, the Court did not, nor did it need to, reach the question whether the BAT standard forbids any comparison of cost to benefits in selecting BAT.

Because this Court's description of BAT in *National Crushed Stone* was far from a holding, the Second Circuit appears alone in concluding that a comparison of costs and benefits, outside that court's very limited "cost-effectiveness" test, is forbidden for BAT and, by extension, for BTA. Indeed, that court's decision is squarely in conflict with the Sixth Circuit's decision in *BP Exploration & Oil v. EPA*, 66 F.3d 784 (6th Cir. 1995). In BP exploration, the Sixth Circuit stated quite unambiguously:

> the CWA's requirement that EPA choose the best technology does not mean that the chosen technology must be the best pollutant removal. Obviously, BAT * * * must be acceptable on the basis of numerous factors, only one of which is pollution control. NRDC ignores the statutory language, which sets up a 'limited' balancing test. In enacting the CWA, Congress did not mandate any particular structure or weight for the many consideration factors. Rather, it left EPA with discretion to decide how to account for the consideration factors, and how much weight to give each factor. Consequently, NRDC is wrong to contend that EPA is not permitted to balance

> factors such as cost against effluent reduction benefits.

Id. at 796 (internal quotation marks and citations omitted). Similarly, in the pre-*National Crushed Stone* case *Weyerhauser Co.* v. *Costle*, 590 F.2d 1011, 1045 (D.C. Cir. 1978), the D.C. Circuit concluded that Congress "left EPA with discretion to decide how to account for the consideration factors," such as cost, under Section 301(b)(2)(B), "and how much weight to give each factor." See also *Nat'l Wildlife Fed'n* v. *EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002).

Other circuit courts have rejected arguments that a formal cost-benefit analysis is *required* in selecting BAT under Section 301, but none have done so on the basis that under *National Crushed Stone* a weighing of costs and benefits is impermissible—as one would expect, if indeed this Court had so held. See, *e.g.*, *Rybachek v. EPA*, 904 F.2d 1276, 1290–91 (9th Cir. 1990); *Am. Petroleum Inst. v. EPA*, 858 F.2d 261, 264 (5th Cir. 1988); *Reynolds Metal Co.* v. *United States EPA*, 760 F.2d 549, 565 (4th Cir. 1985).

All told, the Second Circuit's decision below not only misconstrued Section 316(b), it also inflicted collateral damage on Section 301. As numerous courts of appeal have recognized, neither section limits EPA to the extremely narrow cost-effectiveness test approved by the Second Circuit.

5. In addition to directly conflicting with the interpretation of Sections 301 and 316(b) by other courts of appeal, the Second Circuit's reading of those sections is also inconsistent with the interpretation given by courts of appeal to similar language in other environmental statutes.

For example, in *Gulf Restoration Network* v. *United States Dept. of Trans.*, 452 F.3d 362 (5th Cir. 2006), the Fifth Circuit considered a licensing provision in the Deepwater Port Act requiring a demonstration that the port "will be constructed and operated using best available technology, so as to prevent or minimize adverse impact on the marine environment," *id.* at 371, quoting 33 U.S.C. § 1503(c), language quite similar to that in Sections 301 and 316(b). There, as here, environmental petitioners complained that the Secretary of Transportation erred in permitting use of a technology providing lesser environmental benefits because it had "lower operating costs"; the Secretary responded that the statutory language was "best read to require construction that reasonably minimizes adverse impact to a reasonable degree given all relevant circumstances," a reading of the statute upheld by the Fifth Circuit. See *id.* at 372.

Likewise, in *American Corn Growers Ass'n v. EPA*, 291 F.3d 1 (D.C. Cir. 2002), the D.C. Circuit considered an EPA rule implementing a provision in the Clean Air Act calling for "reasonable progress toward meeting the national visibility goal" of the "prevention of any future, and the remedying of any existing, impairment in visibility." *Id.*, at 3. Under the Act, state authorities were required to consider five factors in deciding what "best available retrofit technology," or "BART," controls to place on a source:

> The costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may

> reasonably be anticipated to result from the use of such technology.

Id., at 5.

EPA's rule, at its core, required the adoption of BART by individual point sources to remedy haze problems in distant areas, even absent a showing that adoption of BART by the particular point source would reduce the haze. The D.C. Circuit rejected this rule as inconsistent with the Act. After noting that "the factors were meant to be considered together by the states," the court negatively observed that "[u]nder EPA's take on the statute, it is therefore entirely possible that a source may be forced to spend millions of dollars for new technology that will have no appreciable effect on the haze in any Class I area." *Id.*, at 6–7.

6. To support its plain-meaning analysis, the Second Circuit also cited this Court's decision in *Donovan* for the proposition that an agency can weigh costs and benefits only where Congress has *explicitly* provided for such an approach. This Court's *Donovan* opinion, however, said no such thing. In *Donovan*, petitioners argued that cost-benefit analysis was *required* under a section of the Occupational Safety and Health Act providing "[t]he Secretary * * * shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity." *Donovan*, 452 U.S. at 506–08. While this Court did observe that "[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the st[illegible]ute," *id.* at 510, that was in the context of determining whether Congress had

intended to require cost-benefit analysis, not whether Congress intended to leave the issue to agency discretion. What this Court said in *Donovan* concerning discerning congressional intent to *require* cost-benefit analysis is wholly beside the point.

Even if the majority opinion in *Donovan* did stand for the principle drawn from it by the Second Circuit, that principle would be clearly inconsistent with this Court's subsequent analysis in *Chevron* and should be revisited. Under *Chevron*, statutory ambiguity connotes a gap to be filled by the agency, not a court. See *Chevron*, 467 U.S. at 843–44. Thus, the Court should in any event review this case to clarify the relationship between *Chevron* and *Donovan*.

7. Unless reviewed and reversed, the Second Circuit's holding that Section 316(b) forbids a weighing of costs and benefits threatens to impose billions of dollars in costs on the electric-generating sector for no appreciable benefit. Indeed, because the Second Circuit reached this result by misreading the BAT standard applicable to all industries under Section 301, the Second Circuit's decision has the potential to impose significant, unnecessary burdens on the entire economy.

The Second Circuit's conclusion that Congress intended to mandate a "technology forcing" policy for the benefit of fish finds no support in the text of the Act. Indeed, Section 301(g) of the Act requires EPA to permit facilities to operate under the less stringent BPT standard, rather than BAT, as long as doing so will not interfere with "the protection and propagation of a balanced population of shellfish, fish, and wildlife." 33 U.S.C. § 1311(g)(1), (g)(2)(C). Similarly, EPA is required to provide point sources with variances from thermal discharge requirements

under Section 316(a) so long as the relaxed requirement "will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife." 33 U.S.C. § 1326(a).

These provisions, particularly in light of their legislative history, make clear that the CWA does not reflect a Congressional obsession with saving every aquatic organism possible; the Act is not a legislative analog to *Finding Nemo*. Rather, when it comes to aquatic life, Congress repeatedly directed EPA to pursue reasonable policies. EPA's limited weighing of costs and benefits in Section 316(b) is consistent with that theme; the Second Circuit's approach is not. Simply put, the sheer implausibility of the Second Circuit's reading of congressional intent confirms the textual evidence of EPA discretion in deciding how to weigh costs and benefits.

In summary, the Second Circuit interpreted Section 316(b) in a manner that is facially implausible and in direct conflict with the First Circuit's interpretation of that Section. It interpreted Section 301 in a manner conflicting with at least the Sixth Circuit's reading of that section. Review and reversal of the Second Circuit's interpretations of Sections 316(b) (and Section 301) is not only merited as a matter of law, but, given the disruption retrofitting of existing power plants would entail for public safety and the national economy, is also a matter of unquestionable importance.

Conclusion

For the foregoing reasons, the petition for a writ of certiorari should be granted.

Respectfully submitted.

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. Pearl Street
Jackson, MS 39201
(601) 969-2542

ELISE N. ZOLI
Counsel of Record
KEVIN P. MARTIN
GOODWIN PROCTER LLP
53 State Street
Boston, MA 02109
(617) 570-1000

Counsel for Petitioner

November 2, 2007

APPENDIX

Supreme Court, U.S.
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No. 07-___

IN THE

Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY ET AL.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Second Circuit

APPENDIX

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. Pearl Street
Jackson, MS 39201
(601) 969-2542

ELISE N. ZOLI
Counsel of Record
KEVIN P. MARTIN
GOODWIN PROCTER LLP
53 State Street
Boston, MA 02109
(617) 570-1000

Counsel for the Petitioner

November 2007

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APPENDIX A

2007 COURT OF APPEALS OPINION

UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

August Term, 2005

(Argued: June 8, 2006 Decided: January 25, 2007

Docket Nos. 04-6692-ag(L), 04-6693-ag(CON), 04-6694-ag(CON), 04-6695-ag(CON), 04-6696-ag(CON), 04-6697-ag(CON), 04-6698-ag(CON), 04-6699-ag(CON).

RIVERKEEPER, INC., NATURAL RESOURCES DEFENSE COUNCIL, WATERKEEPER ALLIANCE, SOUNDKEEPER, INC., SCENIC HUDSON, INC., SAVE THE BAY-PEOPLE FOR NARRAGANSETT BAY, FRIENDS OF CASCO BAY, AMERICAN LITTORAL SOCIETY, DELAWARE RIVERKEEPER NETWORK, HACKENSACK RIVERKEEPER, INC., NEW YORK/NEW JERSEY BAYKEEPER, SANTA MONICA BAYKEEPER, SAN DIEGO BAYKEEPER, CALIFORNIA COASTKEEPER, COLUMBIA RIVERKEEPER, CONSERVATION LAW FOUNDATION, SURFRIDER FOUNDATION, STATE OF RHODE ISLAND, STATE OF CONNECTICUT, STATE OF DELAWARE, COMMONWEALTH OF MASSACHUSETTS, STATE OF NEW JERSEY, STATE OF NEW YORK, APPALACHIAN POWER COMPANY, ILLINOIS ENERGY ASSOCIATION, UTILITY WATER ACT GROUP, PSEG FOSSIL LLC, PSEG NUCLEAR LLC, ENTERGY CORPORATION,

Petitioners,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, STEPHEN L. JOHNSON, in his official capacity as ADMINISTRATOR OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondents.

Before: STRAUB, SOTOMAYOR, and HALL, *Circuit Judges.*

Petitioners challenge a final rule promulgated by the Environmental Protection Agency pursuant to section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), that is intended to protect aquatic organisms from being harmed or killed by cooling water intake structures at large, existing power-producing facilities. While we conclude that certain aspects of the rule are **[2]*** based on a reasonable interpretation of the Clean Water Act and supported by substantial evidence in the administrative record, several aspects of the rule are not consistent with the statute, are not supported by sufficient evidence, or were not properly subject to notice and comment. We therefore grant in part and deny in part the petitions for review and dismiss in part one aspect of

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* [Numbers of the form "[2]" indicate the pagination of the original slip opinion. Numbers of the form "[*89]" indicate the pagination in 475 F.3d.] The introductory paragraph does not appear in F.3d or in the Westlaw version of the decision.

the petitions for lack of jurisdiction because there is not final agency action to review.

[List of counsel omitted]

[5][*89]SOTOMAYOR, Circuit Judge.

This is a case about fish and other aquatic organisms. Power plants and other industrial operations withdraw billions of gallons of water from the nation's waterways each day to cool their facilities. The flow of water into these plants traps (or "impinges") large aquatic organisms against grills or screens, which cover the intake structures, and draws (or "entrains") small aquatic organisms into the cooling mechanism; the resulting impingement and entrainment from these operations kill or injure billions of aquatic organisms every year. Petitioners here challenge a rule promulgated by the Environmental Protection Agency ("the EPA" or "the Agency") pursuant to section 316(b) of the Clean Water Act ("CWA" or "the Act"), 33 U.S.C. § 1326(b),[1] that is intended to protect fish, shellfish, and other aquatic organisms from being harmed or killed by regulating "cooling water intake structures" at large, existing power-producing facilities.

For the reasons that follow, we grant in part and deny in part the petitions for review, concluding that certain aspects of the EPA's rule are based on a reasonable interpretation of the Act and supported by substantial evidence in the administrative record, but remanding several aspects of the rule because they are inadequately explained or inconsistent with

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[1] We refer to statutory provisions mentioned in the text by their section in the CWA and provide in citations both the section of the Act and the parallel section of the United States Code.

the statute, or because the EPA failed to give adequate notice of its rulemaking. We also dismiss for lack of jurisdiction one aspect of the petitions because there is no final agency action to review.

BACKGROUND

Our decision in *Riverkeeper, Inc. v. EPA*, 358 F.3d 174 (2d. Cir. 2004) **[6]** ("*River-***[*90]***keeper I*"), which addressed challenges to the EPA's rule governing cooling water intake structures at new—as opposed to existing—facilities discusses at length the procedural and factual background of the rulemaking pursuant to section 316(b). We presume familiarity with *Riverkeeper I* and provide here only a brief overview of the statute and the various stages of the rulemaking.

These consolidated petitions for review concern a final rule promulgated by the EPA regarding the water that large, existing power plants withdraw from rivers, lakes, and other waterways of the United States to cool their facilities. *See* 40 C.F.R. § 125.91(a). This cooling process requires power plants to extract billions of gallons of water per day from the nation's waters, thereby impinging and entraining a huge number of aquatic organisms. *Riverkeeper I*, 358 F.3d at 181. Indeed, a single power plant can kill or injure billions of aquatic organisms in a single year. *Id.*

Cognizant of this problem, Congress in 1972 amended the CWA, 33 U.S.C. § § 1251–1387, to regulate cooling water intake structures. *See* Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1972). We have described Congress's regulation of such

structures as "something of an afterthought," *Riverkeeper I*, 358 F.3d at 186 n.12, given that the directive appears in a section of the Act addressing the seemingly unrelated issue of thermal pollution, *see* CWA § 316(a), 33 U.S.C. § 1326(a). The Act, as amended, provides that "[a]ny standard established pursuant to section 1311 of this title [CWA section 301] or section 1316 of this title [CWA section 306] and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." [7] CWA § 316(b), 33 U.S.C. § 1326(b).

The provisions of the Act cross-referenced in section 316(b) direct the EPA to issue rules regulating the discharge of pollution from existing point sources, CWA § 301, 33 U.S.C. § 1311, and new point sources, CWA § 306, 33 U.S.C. § 1316.[2] As we noted in *Riverkeeper I*,"[w]hen the EPA established new source performance discharge standard[s] . . . it ought *then* to have regulated . . . intake structures . . . ." 358 F.3d at 185 (internal quotation marks omitted; emphasis in original). Put differently, section 316(b) required the EPA to promulgate regulations for cooling water intake structures at the same time that it established pollution discharge standards pursuant to sections 301 and 306. The EPA's first attempt at regulation under section 316(b), however, was remanded by the Fourth

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[2] A "point source" is "any discernible, confined and discrete conveyance . . . from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

Circuit in 1977 on procedural grounds, and years passed without the EPA issuing new rules. *Id.* at 181 (citing *Appalachian Power Co. v. Train*, 566 F.2d 451 (4th Cir. 1977)). Environmental groups ultimately sued the EPA and won a consent decree, pursuant to which the Agency established a timetable to issue rules pursuant to Section 316(b) in three "phases." *Id.* & n.3. Phase I—addressed in *Riverkeeper I*—governs new facilities; Phase II—addressed here—covers large, existing power plants; and Phase III will regulate existing power plants not governed by Phase II, as well as other industrial facilities. *See Riverkeeper, Inc. v. Whitman*, 2001 WL 1505497, at *1 n.3 (S.D.N.Y. Nov.27, 2001).

[*91] Our interpretation of section 316(b) is informed by the two provisions it cross-references, CWA sections 301 and 306. Section 301 sets forth a framework under which **[8]** limitations on the discharge of pollutants from existing sources would become more stringent over time. CWA § 301(b), 33 U.S.C. § 1311(b); *see Riverkeeper I*, 358 F.3d at 185.

Section 301(b)(1)(A) required the EPA, beginning in 1977, to set effluent limitations for existing sources based on "the best practicable control technology currently available," or "BPT." CWA § 301(b)(1)(A), 33 U.S.C. § 1311(b)(1)(A). By 1989, existing source effluent limitations were to be based on the more stringent "best available technology economically achievable," or "BAT." CWA § 301(b)(2)(A), 33 U.S.C. § 1311(b)(2)(A). Additionally, section 306 requires the EPA to establish "standards of performance" for the control of the discharge of pollutants from new sources based on "the best available demonstrated control

technology," a standard that "reflects the greatest degree of effluent reduction." CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1).

In section 316(b), Congress established yet another standard to govern cooling water intake structures, which requires such structures to reflect the "best technology available for minimizing adverse environmental impact," or "BTA." CWA § 316(b), 33 U.S.C. § 1326(b). We noted in *Riverkeeper I* that "[a]lthough the EPA is permitted to consider a technology's cost in determining whether it is 'practicable,' 'economically achievable,' or 'available,' it should give decreasing weight to expense as facilities have time to plan ahead to meet tougher restrictions." 358 F.3d at 185 (citations omitted). Additionally, we observed that "[b]ecause section 316(b) refers to sections 301 and 306 but provides a different standard ('best technology available for minimizing adverse environmental impact' instead of, for example, 'best available demonstrated control technology') and does not explicitly provide that regulations pursuant to section 316(b) are subject to the requirements of sections 301 and 306, we think it is permissible for the EPA to look to those sections for guidance but to decide that not every statutory directive **[9]** contained therein is applicable" to rulemaking under section 316(b). *Id.* at 187. With this general background in mind, we consider Phases I and II of the EPA's rulemaking.

1. *The Phase I Rule*

On December 18, 2001, the EPA issued its first rule ("the Phase I Rule") governing cooling water intake structures for new—as opposed to existing—facilities. *Regulations Addressing Cooling Water*

Intake Structures for New Facilities; Final Rule, 66 Fed. Reg. 65,256 (Dec. 18, 2001) (codified at 40 C.F.R. pts. 9, 122–25). The Phase I Rule established a two-track approach to regulating cooling water intake systems at new facilities, under which a new facility could choose one of two "tracks" to comply with the statute. Track I created national intake capacity and velocity standards based on closed-cycle cooling technology,[3] which the EPA **[*92]** deemed the best technology available for minimizing adverse environmental impacts. *See Riverkeeper I*, 358 F.3d at 182–83. Track II did not require the use of any specific technology so long as the facility "can show, in a demonstration study, 'that the technologies employed will reduce the level of adverse environmental impact . . . to a comparable level to that which' would be achieved applying Track I's capacity and velocity requirements." *Id.* at 183 (quoting 40 C.F.R. § 125.84(d)(1)).

[10] Environmental and industry groups challenged certain aspects of the rule, including, *inter alia*, the part of the Track II procedure allowing

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[3] As we noted in Riverkeeper I,

> Cooling water systems fall into three groups. "Once-through" systems take water in, use it to absorb heat, and return the water to its source at a higher temperature. "Closed-cycle" systems recirculate the water (after allowing it to cool off in a reservoir or tower before being reused) and add water to the system only to replace that which is lost through evaporation. Closed-cycle systems, therefore, withdraw far less water than once-through systems. Dry cooling systems . . . use air drafts to transfer heat, and, as their name implies, they use little or no water.

358 F.3d at 182 n. 5 (internal citations omitted).

power plants to comply with section 316(b) by undertaking so-called "restoration measures," such as restocking the waterbody with fish, reclaiming abandoned mines to reduce drain-off, or removing barriers to fish migration, to maintain fish and shellfish in a waterbody at certain levels. In *Riverkeeper I*, we upheld most aspects of the Phase I Rule, but remanded the provisions relating to the Track II restoration option. We found that the restoration option was inconsistent with section 316(b)'s requirement that the EPA minimize adverse environmental impacts by regulating the " 'location, design, construction, and capacity of cooling water intake structures' " because this option has nothing to do with the location, design, construction, or capacity of such structures. *Id.* at 189 (quoting CWA § 316(b), 33 U.S.C. § 1326(b)). Given this, we held that the EPA had impermissibly exceeded its authority in allowing Phase I facilities to use these restoration measures to comply with regulations implementing the statute. *Id.*

II. *The Phase II Rule*

On July 9, 2004, the EPA issued a final rule, pursuant to the second phase of the consent decree ("the Phase II Rule" or "the Rule"), that governs cooling water intake structures at large, existing power plants. *See Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities*, 69 Fed. Reg. 41,576 (July 9, 2004) (codified at 40 C.F.R. pts. 9, 122–125). The Phase II Rule covers existing facilities that are "point sources" and that, as their primary activity, "both generate[] and transmit[] electric power, or generate[ ] electric power but sell[] it to another

entity for transmission," "use[] or propose[] to use cooling water intake structures with a total design intake flow of 50 million gallons per day (MGD) or **[11]** more," and "use[] at least 25 percent of water withdrawn exclusively for cooling purposes." 40 C.F.R. § 125.91. Although we will discuss the specifics of the Rule with respect to each challenge, we provide here an overview of the Rule.

The Phase II Rule sets forth five compliance alternatives. *See* 40 C.F.R. § 125.94(a). Section 125.94(a) requires that a facility select and implement one of the following "for establishing best technology available for minimizing adverse environmental impact":

> (1)(i) You may demonstrate to the Director that you have reduced, or will reduce, your flow commensurate with a closed-cycle recirculating system. In this case, you are deemed to have met the applicable performance standards and will not be required to demonstrate further that your facility meets the impingement mortality and entrainment performance standards specified in paragraph (b) of this section. . . .[;] or
>
> (ii) You may demonstrate to the Director that you have reduced, or will reduce, your maximum through-screen **[*93]** design intake velocity to 0.5 ft/s or less. In this case, you are deemed to have met the impingement mortality performance standards and will not be required to demonstrate further that your facility meets the performance standards for impingement mortality specified in paragraph (b) of this section and you are not subject to the requirements in §§ 125.95, 125.96, 125.97, or 125.98 as they apply

to impingement mortality. However, you are still subject to any applicable requirements for entrainment reduction . . . .;]

(2) You may demonstrate to the Director that your existing design and construction technologies, operational measures, and/or restoration measures meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section[;]

(3) You may demonstrate to the Director that you have selected, and will install and properly operate and maintain, design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section;

(4) You may demonstrate to the Director that you have installed, or will install, and properly operate and maintain an approved design and construction technology in accordance with § 125.99(a) or (b); or

[12] (5) You may demonstrate to the Director that you have selected, installed, and are properly operating and maintaining, or will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures that the Director has determined to be the best

> technology available to minimize adverse environmental impact for your facility in accordance with paragraphs (a)(5)(i) or (ii) of this section. . . .

40 C.F.R. § 125.94(a).

The Phase II Rule does not require large, existing power plants to install closed-cycle cooling systems, although a facility with such a system (or one whose intake flow is commensurate with that of a closed-cycle system) will be considered in compliance with the Rule. 40 C.F.R. § 125.94(a)(1)(i). The Rule instead references national performance standards, discussed below, that "are based on consideration of a range of technologies that EPA has determined to be commercially available for the industries affected as a whole." 69 Fed. Reg. at 41,598–99. And rather than limiting BTA to technologies based on closed-cycle cooling systems, the EPA designated a "suite" of technologies—including fine- and wide-mesh wedgewire screens, aquatic filter barrier systems, barrier nets, and fish return systems, among others, *id.* at 41,599; *see also* 40 C.F.R. § 125.99(a)—as BTA for large, existing power plants.

Section 125.94(b) establishes national performance standards to be achieved through one of the compliance alternatives set forth in section 125.94(a). With respect to impingement mortality, it provides that facilities choosing "compliance alternatives in paragraphs (a)(2), (a)(3), or (a)(4) of this section . . . must reduce impingement mortality for all life stages of fish and shellfish by 80 to 95

percent from the calculation baseline."[1] *Id.* **[*94]** § 125.94(b)(1). With **[13]** respect to entrainment, facilities that choose

> compliance alternatives in paragraphs (a)(1)(ii), (a)(2), (a)(3), or (a)(4) of this section . . . must also reduce entrainment of all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline if:
>
> > (i) [the] facility has a capacity utilization rate of 15 percent or greater, and
> >
> > (ii)(A) . . . uses cooling water withdrawn from a tidal river, estuary, ocean, or one of the Great Lakes; or (B) . . . uses cooling water withdrawn from a freshwater river or stream and the design intake flow of your cooling water intake structures is greater than five percent of the mean annual flow.

Id. § 125.94(b)(2).

Section 125.94(c) permits facilities to comply with the Rule by implementing restoration measures "in place of or as a supplement to installing design and control technologies and/or adopting operational measures that reduce impingement mortality and entrainment." *Id.* § 125.94(c). In order to adopt restoration measures under the Rule, a facility must

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[1] The "calculation baseline" is "an estimate of impingement mortality and entrainment that would occur" at a specific site based on a number of quantitative assumptions regarding intake velocity and the location and design of the site's intake structures. 40 C.F.R. § 125.93. The regulation also permits a site's specific historical and current data on impingement and entrainment to serve as a basis for this baseline. *Id.*

demonstrate that "meeting the applicable performance standards or site-specific requirements through the use of design and construction technologies and/or operational measures alone is less feasible, less cost-effective, or less environmentally desirable than meeting the standards . . . through the use of restoration measures." *Id.* § 125.94(c)(1). Moreover, the restoration measures implemented by the facility must produce ecological benefits "at a level that is substantially similar" to what would be achieved by meeting the national performance standards of section 125.94(b). *Id.* § 125.94(c)(2).

The compliance provision of section 125.94(a)(5) permits what is in effect a site-specific compliance alternative to the generally applicable performance standards in two **[14]** circumstances. In the first circumstance ("the cost-cost compliance alternative" or "the cost-cost variance"), if a facility demonstrates that its compliance costs "would be significantly greater than the costs considered by the Administrator," the permitting authority must make a site-specific determination of BTA that is "as close as practicable to the applicable performance standards . . . without resulting in costs that are significantly greater than the costs considered by the Administrator" in establishing those standards. 40 C.F.R. § 125.94(a)(5)(i). In the second circumstance ("the cost-benefit compliance alternative" or "the cost-benefit variance"), the permitting authority must make a site-specific determination of BTA that is "as close as practicable" to the national performance standards if a facility demonstrates that its compliance costs would be "significantly greater than the benefits of complying" with the

performance standards at the facility. *Id.* § 125.94(a)(5)(ii).

For those facilities installing technologies designated as BTA, section 125.94(d) allows the national performance standards set forth in section 125.94(b) to be satisfied by demonstrating compliance with a technology installation and operation plan ("TIOP"), which concerns, *inter alia*, a facility's installation, operation and maintenance of BTA. As the Rule is enforced through the permitting process under the National Pollutant Discharge Elimination **[*95]** System ("NPDES"),[5] section 125.94(d)(1) provides that a facility that uses one of the compliance methods other than closed-cycle cooling may request that compliance with the national performance standards during the first permit cycle be determined with respect to whether the facility has complied with the TIOP it submitted with its permit application. Section **[15]** 125.94(d)(2) authorizes facilities to request that compliance during subsequent permit terms be determined based on whether a facility remains in compliance with its TIOP, and in accordance with any necessary revisions, "if applicable performance standards are not being met." 40 C.F.R. § 125.94(d)(2).

Finally, section 125.94(f) applies solely to nuclear power facilities. It provides that if a nuclear facility's compliance with the Rule would conflict with a safety requirement established by the Nuclear Regulatory Commission, the EPA must make a site-specific determination of BTA that would not conflict

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[5] The NPDES process is promulgated under CWA section 402(a)(1), 33 U.S.C. § 1342(a)(1).

with the Commission's safety requirement. 40 C.F.R. § 125.94(f).

For purposes of judicial review, the Phase II Rule was promulgated on July 23, 2004. See 69 Fed. Reg. at 41,576. Three sets of petitioners, discussed below, brought timely challenges to the Rule.[6]

DISCUSSION

I. *Standard of Review*

We have jurisdiction to review this Rule pursuant to CWA section 509(b)(1), 33 U.S.C. § 1369(b)(1). *See Riverkeeper I*, 358 F.3d at 183 (stating that the Phase I Rule is covered by the jurisdictional grant of § 1369(b)(1)). As we explained in *Riverkeeper I*, our substantive review is twofold. "First, we examine the regulation against the statute that contains the EPA's charge." *Id.* at 184. If Congress "has directly spoken to the precise question at issue" and its **[16]** intent is clear, we "must give effect to the unambiguously expressed intent of Congress." *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984). If, however, the statute is silent or ambiguous, we ask whether "the agency's answer is based on a permissible construction of the statute." *Id.* at 843.

Second, if the agency has followed Congress's unambiguously expressed intent or permissibly

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[6] The parties filed petitions for review here as well as in several of our sister circuits. The petitions were consolidated in the Ninth Circuit by order of the judicial panel on multi-district litigation pursuant to 28 U.S.C. §§ 1407 and 2112(a)(3). The Ninth Circuit thereafter transferred the case here pursuant to 28 U.S.C. § 2112(a)(5).

construed an ambiguous statute, "we measure the regulation against the record developed during the rulemaking, but we 'hold unlawful' the agency's regulation only if it is 'arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.' "*Riverkeeper I*, 358 F.3d at 184 (quoting 5 U.S.C. § 706(2)(A)). "Normally, we must deem arbitrary and capricious an agency rule where 'the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.' "*Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 498 (2d Cir. 2005) (quoting **[*96]** *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, (1983) (internal quotation marks and citations omitted)).

Finally, our review has a procedural dimension. The Administrative Procedure Act ("APA") requires that notice of proposed rulemaking be published in the Federal Register, 5 U.S.C. § 553(b)(3), and that interested parties be allowed an opportunity to comment on proposed rules, *id.* § 553(c). Where an agency fails to comply with the APA's notice and comment provisions, we remand to the agency for further proceedings. *See Sprint Corp. v. FCC*, 315 F.3d 369, 371 (D.C. Cir.2003) ("Because the [agency] failed to provide adequate notice and **[17]** opportunity to comment, we grant the petition and remand the case to the [agency].").

II. *The Petitions for Review*

The state petitioners[7] and the self-styled environmental petitioners[8] challenge the Rule on similar grounds. Their petitions contain the following arguments: (1) the EPA exceeded its authority in rejecting closed-cycle cooling as BTA for existing facilities generally, and the Agency's rejection of closed-cycle cooling as BTA for facilities on sensitive waterbodies is not entitled to deference because the decision was made at the direction of the Office of Management and Budget ("OMB"); (2) the EPA exceeded its authority by establishing ranges of acceptable performance rather than a single-numeric performance standard; (3) the CWA does not allow restoration measures as a means of compliance; (4) the EPA failed to give adequate notice that it would allow site-specific determinations of BTA based on cost-cost analysis, and the EPA impermissibly construed the statute to allow site-specific determinations of BTA based on cost-benefit analysis; (5) the provision allowing that compliance with the performance standards be determined by establishing compliance with a facility's TIOP is unauthorized and violates the rulemaking require-

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[7] Rhode Island, Connecticut, Delaware, Massachusetts, New Jersey, and New York.

[8] Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay-People for Narragansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, and Surfrider Foundation.

ment of notice and comment; and (6) the Agency has classified certain new constructions as "existing facilities" contrary to the definitions set forth in the Phase I Rule without providing adequate notice and opportunity for comment.

[18] Three groups of industry petitioners, which we will refer to collectively as the "industry petitioners" or individually as Entergy Corporation ("Entergy"), the Utility Water Act Group ("UWAG"),[9] and PSEG Fossil LLC and PSEG Nuclear LLC ("PSEG"), advance various challenges to the Phase II Rule. Their challenges raise the following arguments: (1) section 316(b) of the CWA does not apply to existing facilities; (2) the Agency's definition of "adverse environmental impact" is insufficiently supported by the record; (3) the EPA's assumption of zero entrainment survival is insufficiently supported by the record; (4) the EPA improperly requires evaluation of qualitative non-use benefits in site-specific cost-benefit analyses; (5) the Agency failed to account for the Rule's disproportionate impact on nuclear facilities; **[*97]** (6) the EPA gave inadequate notice of the independent-supplier provision; and (7) the Agency provided no notice of its post-rulemaking definition of "Great Lakes." The industry petitioners also seek to preserve the right on this petition for review to raise new challenges to the Rule if we remand significant aspects of it. We consider first the challenges raised by the state and environmental

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[9] UWAG petitions this court in conjunction with the Appalachian Power Company and the Illinois Energy Association.

petitioners and then will turn to the industry petitioners' challenges.

III. *The State and Environmental Petitioners*

A. *Determination of BTA*

Perhaps the most significant challenge to the Phase II Rule is the petitioners' contention that the EPA exceeded its authority in rejecting closed-cycle cooling, and selecting instead the suite of technologies, as the "best technology available" as required by section 316(b), 33 U.S.C. § 1326(b), in large part because the Agency engaged in improper cost considerations.

[19] This challenge requires us at the outset to determine to what extent, if any, the EPA can consider cost when selecting "the best technology available for minimizing adverse environmental impact" under the statute.

1. *Cost Analysis Pursuant to Sections 301 and 306*

Section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that the EPA must consider in determining BTA. The statute, however, does make specific reference to CWA sections 301 and 306, which we have taken previously as "an invitation" to look to those sections for guidance in "discerning what factors Congress intended the EPA to consider in determining" BTA. *Riverkeeper I*, 358 F.3d at 186. We look to each of these statutes in turn.

Section 301(b)(1)(A) established the BPT standard that governed the effluent limitations applicable to existing sources through 1989. Congress provided

that, in determining BPT, the Agency could consider "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." CWA § 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B). As noted above, however, the CWA created standards that were to become increasingly stringent over time, and in 1989, the more lenient BPT standard for existing sources was replaced by the BAT standard of section 301(b)(2)(A), in which Congress provided that the EPA could consider only "the cost of achieving such effluent reduction." CWA § 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B). Notably omitted from the list of permissible factors to which the EPA could look in determining BAT was the cost of technology in relation to the benefits that technology could achieve.

This shift from BPT to BAT fundamentally altered the way in which the EPA **[20]** could factor cost into its CWA determinations. Indeed, in analyzing BPT and BAT, the Supreme Court stated that in "assessing BAT[,] total cost is no longer to be considered in comparison to effluent reduction benefits," as it had been in assessing BPT. *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71, 101 S. Ct. 295, 66 L. Ed. 2d 268 (1980). The Court indicated that the less stringent BPT standard had allowed for a "limited cost-benefit analysis" intended to " 'limit the application of technology only where the additional degree of effluent reduction is wholly out of proportion to the costs of achieving such marginal level of reduction.' " *Id.* at 71 n. 10, 101 S. Ct. 295 (quoting Remarks of Senator Muskie reprinted in Legislative **[*98]** History of the Water Pollution Control Act Amendments of 1972 (Committee Print compiled for the Senate Committee on Public Works

by the Library of Congress) Ser. No. 93-1, p. 170 (1973)). In determining BAT, by contrast, the EPA may consider cost as a factor to a limited degree, *see id.*, but only as to whether the cost of a given technology could be reasonably borne by the industry and not the relation between that technology's cost and the benefits it achieves, *Riverkeeper I*, 358 F.3d at 195.

Section 306, which governs the effluent limitations that apply to new sources, provides that a "standard of performance" established by the EPA must reflect the "best available demonstrated control technology." CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1). In language identical to the text of § 304(b)(2)(B) governing BAT, Congress provided that in establishing standards of performance, the EPA "shall take into consideration the cost of achieving such effluent reduction," CWA § 306(b)(1)(B), 33 U.S.C. § 1316(b)(1)(B), but did not require the EPA to conduct cost-benefit analysis. *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002) ("[S]ection 306 requires that, when setting the [new source performance standards], the Administrator must take costs into consideration, but does not require that she conduct a **[21]** cost-benefit analysis."). Sections 301 and 306 of the CWA thus demonstrate that, after 1989, cost is a lesser, more ancillary consideration in determining what technology the EPA should require for compliance under those sections.

The shift from the BPT standard to the more stringent BAT one clearly signaled Congress's intent to move cost considerations under the CWA from a cost-benefit analysis to a cost-effectiveness one. We understand the difference between these two

analyses to turn on the difference between means and ends. Cost-benefit analysis, like BPT, compares the costs and benefits of various ends, and chooses the end with the best net benefits. By contrast, cost-effectiveness considerations, like BAT, determine which means will be used to reach a specified level of benefit that has already been established.[10] Given the above and considering the parallel language of sections 304(b)(2)(B) and 306(b)(1)(B), the reasoning of *National Crushed Stone* strongly suggests that cost-benefit analysis is no longer permitted under those sections of the CWA.

2. *Cost Analysis Pursuant to Section 316(b)*

As already noted, section 316(b) does not itself set forth the factors that the Agency can consider in determining the "best technology available for minimizing adverse environmental impact." The BTA standard of section 316(b), however, is linguistically similar to the BAT standard of section 301 and the standard that applies to new sources under **[22]** section 306, and to the extent that cost-benefit analysis is precluded under those statutes, one might reasonably conclude that it is similarly not permitted under section 316(b). We conclude in any event that the language of section 316(b) itself

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[10] *See, e.g.*, OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Appendix A (1992) (defining "benefit-cost analysis" as "[a] systematic quantitative method of assessing the desirability of government projects or policies when it is important to take a long view of future effects and a broad view of possible side-effects" and "cost-effectiveness" as "[a] systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits or a given objective").

plainly indicates that facilities must adopt the *best* technology available and that cost-benefit analysis **[*99]** cannot be justified in light of Congress's directive.

We stated in *Riverkeeper I* that the EPA can consider cost in establishing BTA, but only in a limited fashion and not as a primary consideration. Indeed, "[w]ith respect to costs, 'the Administrator must inquire into the initial and annual costs of applying the technology and make an affirmative determination that those costs can be *reasonably borne* by the industry.' "*Riverkeeper I*, 358 F.3d at 195 (quoting *Chem. Mfrs. Ass'n v. EPA*, 870 F.2d 177, 262 (5th Cir. 1989)) (emphasis added). While the statutory language suggests that the EPA may consider costs in determining BTA, in that a technology that cannot not be reasonably borne by the industry is not "available" in any meaningful sense, cost-benefit analysis is not similarly supported by the language or purpose of the statute. Section 316(b) expressly requires a technology-driven result, *cf. Natural Res. Def. Council, Inc. v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) ("[T]he most salient characteristic of [the CWA's] statutory scheme, articulated time and again by its architects and embedded in the statutory language, is that it is technology-forcing."), not one driven by cost considerations or an assessment of the desirability of reducing adverse environmental impacts in light of the cost of doing so. A selection of BTA based on cost-benefit considerations is thus impermissibly cost-driven, but a selection based in part on cost-effectiveness considerations, while taking cost into account, remains technology-driven. The statute therefore precludes cost-benefit analysis because

"Congress itself defined the basic relationship between costs and **[23]** benefits." *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 509, (1981). Moreover, this conclusion is further supported by the fact that Congress in establishing BTA did not expressly permit the Agency to consider the relationship of a technology's cost to the level of reduction of adverse environmental impact it produces.[11] "When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute." *Id.* at 510, 101 S. Ct. 2478.

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[11] This conclusion accords with the analysis in *Riverkeeper I* that the EPA may consider cost in establishing BTA pursuant to section 316(b), but only in a limited way. In our discussion of the EPA's choice of closed-cycle, rather than dry, cooling as BTA for Phase I facilities, *see*358 F.3d at 194-95, 194 n. 22, we noted that "dry cooling costs more than ten times as much per year as closed-cycle wet cooling," but emphasized that "it is estimated to reduce water intake by only an additional 5 percent relative to once-through cooling." *Id.* at 194 (internal footnotes omitted). We acknowledged that dry cooling is both much more effective and much more expensive than closed-cycle cooling in absolute terms, but stressed that, as compared to the baseline of once-through cooling systems, the marginal benefits of dry cooling were small: "it is undeniably relevant that that difference represents a relatively small improvement over closed-cycle cooling at a very significant cost." *Id.* at 194 n.22. In dicta, we characterized this mode of analysis as "relevant" and stated that it "adds a useful perspective," *id.*, but did not treat it as the fulcrum of our analysis. Ultimately, we deferred to the EPA's determination insofar as it was based on the grounds that dry cooling was too expensive for industry reasonably to bear and that dry cooling has negative environmental effects best left to the considered judgment of the Agency. *Id.* at 195-96.

Given the above, the EPA may permissibly consider cost in two ways: (1) to determine what technology can be "reasonably borne" by the industry and (2) to engage in cost-effectiveness analysis in determining BTA. Thus, the EPA must first determine what is the most effective technology that may reasonably be borne by the industry. In making this initial determination, **[*100]** the most effective technology must be based not on the average Phase II facility but on the optimally best performing Phase II facilities, *see, e.g., Kennecott v. United States EPA*, 780 F.2d 445, 448 (4th Cir. 1985) ("In setting BAT, EPA uses not the average p ant, but the **[24]** optimally operating plant, the pilot plant which acts as a beacon to show what is possible."), although, of course, the EPA must still ascertain whether the industry as a whole can reasonably bear the cost of the adoption of the technology, bearing in mind the aspirational and technology-forcing character of the CWA. This technology constitutes the benchmark for performance. Once this determination has been made, the EPA may then consider other factors, including cost-effectiveness, to choose a less expensive technology that achieves essentially the same results as the benchmark.[12] For example,

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[12] We note that the EPA is by no means required to engage in cost-effectiveness analysis. Indeed, to require the Agency to conduct cost-effectiveness analysis would transform such analysis into a primary factor in choosing BTA, which clearly is contrary to the technology-forcing principle that animates the CWA. Equally important, we note that the Agency may also depart from this performance benchmark because of other permissible considerations aside from cost, for instance, energy efficiency or environmental impact. *See Riverkeeper I*, 358 F.3d at 195-96 (noting "the EPA was permitted to consider . . .

assuming the EPA has determined that power plants governed by the Phase II Rule can reasonably bear the price of technology that saves between 100–105 fish, the EPA, given a choice between a technology that costs $100 to save 99–101 fish and one that costs $150 to save 100–103 fish (with all other considerations, like energy production or efficiency, being equal), could appropriately choose the cheaper technology on cost-effectiveness grounds. Cost-benefit analysis, however, is not permitted under the statute because, as noted, Congress has already specified the relationship between cost and benefits in requiring that the **[25]** technology designated by the EPA be the best available.[13] *Cf. Am. Textile Mfrs. Inst.*, 452 U.S. at 509–10. The Agency accordingly could not make the policy decision, in the face of Congress's determination that facilities use the best technology available, that an economically feasible level of reduction of impingement mortality and entrainment is not desirable in light of its cost. Indeed, in the example above, the EPA could not choose the cheaper technology on cost considerations under section 316(b) if the EPA had first determined

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energy efficiency in determining the 'best technology available' " and could also factor in environmental impact). While the EPA has indicated throughout the record and its briefing before us that its determination of BTA here included such considerations as energy efficiency and production concerns, we nevertheless must remand, as we explain below, for further explanation from the Agency. Accordingly, we express no view on the merits of the EPA's determination regarding the other factors it claims influenced its decision.

[13] For this reason, we reject Entergy's argument that the Rule is improper because its cost exceeds its benefits.

that the power plants could reasonably bear the cost of technology that could save at least 102 fish.

We nevertheless acknowledge that the comparable technologies considered by the Agency need not be identically effective for the Agency to engage in cost-effectiveness analysis. Were that the case, all that would be required would be the simple determination of which among competing technologies that achieved the same degree of reduction of adverse environmental impacts is the cheapest. Instead, the specified level of benefit is more properly understood as a narrowly bounded range, within which the EPA may permissibly **[*101]** choose between two (or more) technologies that produce essentially the same benefits but have markedly different costs. With these considerations in mind, we turn to the Rule as promulgated.

3. *The Determination of BTA under the Phase II Rule*

As noted previously, unlike the Phase I Rule, the Phase II Rule does not require facilities to reduce intake flow to a level commensurate with the intake of closed-cycle systems. Instead, the Rule requires facilities to meet the national performance standards associated with the suite of technologies the EPA identified as BTA. Petitioners' challenge here has two **[26]** components. First, the state petitioners contend that closed-cycle cooling is the best technology available and that the EPA has exceeded its authority by promulgating a rule that does not require closed-cycle cooling, or the use of technologies producing a commensurate reduction of water usage for existing facilities in the same manner as the Phase I Rule required for new

facilities.[14] Second, the environmental petitioners argue that the EPA improperly rejected closed-cycle cooling as BTA for the largest facilities on the most sensitive waterbodies at the direction of OMB because it sought to maximize net economic benefits rather than to minimize adverse environmental impact. They further argue that the BTA standard of section 316(b) requires a commitment of the maximum resources economically feasible to the goal of eliminating adverse environmental impacts and that the statute does not permit the EPA to select BTA on the basis of cost-benefit analysis.

For the reasons that follow, we conclude that the statute's "best technology available" standard permits cost-effectiveness considerations to influence the choice among technologies whose performance does not essentially differ from the performance of the best-performing technology whose cost the industry reasonably can bear, but that the statute does not permit the EPA to choose BTA on the basis of cost-benefit analysis. As we explain below, however, the record is unclear as to the basis for the EPA's selection of the suite of technologies as BTA, and we therefore remand for clarification of the basis for the Agency's decision and potentially for a reassessment of BTA.

[27] The EPA stated in the Rule's preamble that the BTA standard should be interpreted as "best

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[14] While the state petitioners frame their argument as a challenge to the site-specific compliance alternatives, their brief presses the view that closed-cycle cooling is the best technology available and that the EPA exceeded its authority in failing to require Phase II facilities to adopt it.

technology available commercially at an economically practicable cost," and explained that "an important component of economic practicability" is "the relationship of costs to environmental benefits." 69 Fed. Reg. at 41,604. The EPA further explained that this inquiry required that "there should be some reasonable relationship between the *cost* of cooling water intake structure control technology and the environmental *benefits* associated with its use." *Id.* (emphasis added).

The EPA took this "economically practicable" concept directly from the text of a floor speech of a single representative—the only specific reference to section 316(b) in the congressional debates. *See Riverkeeper I*, 358 F.3d at 186 n.12. We noted in *Riverkeeper I* that the "paucity" of legislative history "counsels against imputing much specific intent to Congress beyond the section's words themselves." *Id.* **[*102]** Moreover, we find the EPA's interpretation of section 316(b) problematic because its construction significantly resembles the less stringent, and now obsolete, BPT standard of section 301(b)(1)(A). As noted earlier, in setting forth the factors for the EPA to consider in establishing BPT under section 301(b)(1)(A) and the more stringent BAT under section 301(b)(2)(A), Congress made only one distinction: while the Agency could consider the relationship between cost and benefits in establishing BPT, CWA § 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B), it could consider cost insofar as it can be "reasonably borne" by the industry, but not the relationship between cost and benefits, in establishing BAT, CWA § 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B). *Riverkeeper I*, 358 F.3d at 195.

This difference in how the EPA can consider cost under section 304(b) in establishing BPT and BAT is directly mirrored by the most significant textual distinction **[28]** between sections 301(b)(1)(A) and 301(b)(2)(A)—the requirement that a technology be "practicable" under only the less stringent BPT standard. *Compare* CWA § 301(b)(1)(A), 33 U.S.C. § 1311(b)(1)(A) (BPT is the "best practicable control technology") *with* CWA § 301(b)(2)(A), 33 U.S.C. 1311(b)(2)(A) (BAT is the "best available technology"). The use of the word "practicable," therefore, when coupled with the permissible cost considerations under section 304, signals that Congress intended the EPA to strike a balance between cost and benefits in determining BPT. But the word "practicable" is missing from the more stringent BAT standard, under which Congress prohibited the EPA from considering the relation of cost to benefits. This omission is thus significant. *See Russello v. United States*, 464 U.S. 16, 23, 104 S. Ct. 296, 78 L. Ed. 2d 17 (1983) ("[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion." (quotation marks and citation omitted; alteration in original)). Because Congress also omitted "practicable" from section 316(b), we are troubled by the Agency's interpretation of the statute to require "practicability" analysis here and its implicit corollary that the Agency can undertake a cost-benefit analysis in establishing BTA under section 316(b).

Our concern with the EPA's determination with respect to section 316(b) is further deepened by the Agency's rejection of closed-cycle cooling and selection of a suite of technologies as the basis for BTA for existing facilities because the suite of technologies were the most "cost effective" option. 69 Fed. Reg. at 41,667. The EPA explained this decision on several grounds. It first noted that it was rejecting closed-cycle cooling as BTA because of (1) "its generally high costs (due to conversions)," (2) "the fact that other technologies approach the performance of this **[29]** option," and (3) "concerns for energy impacts due to retrofitting existing facilities, and other considerations." *Id.* at 41,605. The EPA emphasized that it selected BTA based on its determination that "a national requirement to retrofit existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable." *Id.* It further explained that its rejection of closed-cycle cooling as BTA was based on "total social costs" and "lack of cost-effectiveness," as well as "concerns regarding potential energy impacts." *Id.* at 41,606.

Given the EPA's discussion, noted above, of economically practicability, it is unclear whether the Agency improperly weighed the benefits and the costs of requiring closed-cycle cooling. Indeed, a **[*103]** comparison between the cost of closed-cycle cooling and the monetized benefits of this technology appears to have played some role in the EPA's rejection of this option as BTA. In the preamble to the proposed Rule, for instance, the EPA examined whether to require closed-cycle cooling on specific large bodies of waters and stated that "the incremental costs of [this closed-cycle cooling] option

relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." 67 Fed. Reg. at 17,158. Other record evidence on the EPA's rejection of closed-cycle cooling as BTA is a terse EPA memorandum indicating that a requirement commensurate with closed-cycle cooling for facilities on sensitive waterbodies would cost three times as much as the option ultimately adopted by the EPA and reduce entrainment, at most, by 1.33 times that option.

Given the above indications that the EPA engaged in cost-benefit analysis, we remand for the EPA to explain its conclusions. At the outset, it is difficult to discern from the record how the EPA determined that the cost of closed-cycle cooling could not be reasonably **[30]** borne by the industry.[15] Additionally, the EPA did not explain its statement that the suite of technologies "approach[es]" the performance of closed-cycle cooling. We see no adequate comparison in the Rule's proposal, the final

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[15] Indeed, at one point in the Rule's proposal, the EPA mentions that requiring closed-cycle cooling at 539 existing power plants nationwide subject to the Phase II Rule would cost upwards of $2.26 billion and could close nine power plants (about 1.6% of all Phase II facilities). 67 Fed. Reg. at 17,155. There is little discussion about whether the industry could reasonably bear this burden. We note that in *Riverkeeper I*, it appears the EPA supplied the court with better data on this question, noting that of the 83 facilities subject to the Phase I Rule, dry cooling compliance costs would equal on average more than 4% of revenue for all 83 producers and more than 10% of the revenue at 12 facilities (nearly 15% of all Phase I facilities), presenting a possibly high barrier to entry for new facilities. *See Riverkeeper I*, 358 F.3d at 194. We have found no comparable data in the record, nor has the EPA cited any.

Rule or its preamble, or the EPA's submissions to this Court of the effectiveness of closed-cycle cooling and the group of technologies whose effectiveness provided the basis for the Phase II Rule's performance standards.[16] In a [*104] technical [31]

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[16] Some limited evidence, however, is available in the record in intelligible form. In the Rule's proposal, the EPA noted that closed-cycle systems "generally reduce the water flow from 72 percent to 98 percent, thereby using only 2 percent to 28 percent of the water used by once-through systems." *Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Proposed Rule*, 67 Fed. Reg. 17,122, 17,189 (Apr. 9, 2002). The Agency went on to state that "[i]t is generally assumed that this would result in a comparable reduction in impingement and entrainment," *id.*, indicating that closed-cycle systems reduce the adverse impacts of impingement and entrainment by 72 to 98 percent. In a technical development document ("TDD") for the proposal, however, the EPA disaggregated these data, stating that closed cycle cooling systems use 96 to 98 percent less *fresh* water and 70 to 96 percent less *salt* water than once-through systems. TDD for the Proposed § 316(b) Phase II Existing Facilities Rule 4-1; *see also Riverkeeper I*, 358 F.3d at 194 n. 22 ("[C]losed-cycle wet cooling systems use 96 to 98 percent less fresh water (and 70 to 96 percent less salt water) than similarly situated once-through systems."(citing 66 Fed. Reg. at 65,273)). The EPA's analysis in its proposal suggests that the disaggregated data indicate that closed-cycle cooling would reduce impingement mortality and entrainment by 96 to 98 percent at facilities that use fresh water and by 70 to 96 percent at facilities that use salt water. A 72 to 98 percent reduction of impingement mortality and entrainment, and the corresponding disaggregated percent reductions for facilities using salt and fresh water, differs from the Phase II requirement that facilities reduce impingement mortality by 80 to 95 percent and entrainment by 60 to 90 percent. These differences seem potentially significant, especially in determining whether this suite of BTA technologies achieve essentially the same result as closed-cycle cooling, but are

area of this sort, it is difficult for judges or interested parties to determine the propriety of the Agency's action without a justification for the action supported by clearly identified substantial evidence whose import is explained. The record evidence alone here, which consists in large part of a voluminous database compilation of studies that assess the efficacy of various technologies at different locations, is oblique, complicated, and insufficient to permit us to determine what the EPA relied upon in reaching its conclusion. As the Supreme Court has emphasized, "[o]ur recognition of Congress' need to vest administrative agencies with ample power to assist in the difficult task of governing a vast and complex industrial Nation carries with it the correlative responsibility of the agency to explain the rationale and factual basis for its decision, even though we show respect for the agency's judgment in both." *Bowen v. Am. Hosp. Ass'n*, 476 U.S. 610, 627, 106 S. Ct. 2101, 90 L. Ed. 2d 584 (1986) (plurality opinion).

The EPA was required to explain its judgment and the basis for it. Because the EPA purported to base its decision in large part on cost-effectiveness considerations, it was required to identify and explain any evidence indicating a minimal performance difference between comparable technologies, but it did not do so here. It stated only

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neither explained nor adequately compared for purposes of our review here. For instance, there does not appear to be any discussion regarding the seemingly large differences in the rates of impingement and entrainment reduction between closed-cycle cooling and the Phase II national performance standards.

that the performance of the technologies it identified as BTA "approach" the performance of closed-cycle cooling.[17]

[32] We therefore find it impossible to judge whether the performance of these technologies is essentially the same as the performance of closed-cycle cooling, or whether they simply are cheaper per percentage point of reduction in entrainment and impingement mortality. That is, on the record before us, it is impossible to tell whether the EPA based its decision on permissible cost-effectiveness analysis or exceeded its authority by relying impermissibly upon a cost-benefit analysis. To the extent that the record does not indicate the EPA's basis, however, its statement that "the relationship of costs to environmental benefits is an important component of economic practicability," 69 Fed. Reg. at 41,604, indicates that cost-benefit analysis, under the cover of considerations of "practicability," was central to the Agency's decisionmaking.

In short, the EPA's failure to explain its decision frustrates effective judicial review. If the EPA construed the statute to permit cost-benefit analysis, its action was not "based on a permissible construction of the statute." *Chevron*, 467 U.S. at 843. It may also be that the EPA misunderstood or misapplied cost-effectiveness analysis. If so, its

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[17] The Agency, however, did provide some indication of the relative *costs* of closed cycle cooling and the suite of technologies identified as BTA. The EPA stated in the preamble to the Rule that the "total social cost" of closed-cycle cooling would be "$3.5 billion per year," 69 Fed. Reg. at 41,605, and that the "final rule will have total annualized social (pre-tax) costs of $389 million," *id.* at 41,650.

decision was arbitrary and capricious because the Agency relied on factors Congress has not intended it to consider. *See Waterkeeper Alliance*, 399 F.3d at 498. Finally, the **[*105]** EPA may have simply failed either to perform the required analysis or to explain adequately a decision that was within its authority to make. We cannot opine on this subject, because we must consider only those justifications that the EPA offered at the time of the rulemaking. *See SEC v. Chenery*, 318 U.S. 80, 87–88. Moreover, while the EPA could rely on factors other than impingement and entrainment in establishing BTA, such as negative environmental impacts or concerns about energy production and efficiency, *see Riverkeeper I*, 358 F.3d at 195-96, we are unable to determine, on the record before us, whether the EPA gave paramount consideration to an improper factor in determining **[33]** BTA. We therefore remand for clarification of the basis for the Agency's action and possibly for a new determination of BTA.[18]

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[18] As previously noted, the environmental petitioners, supported by amicus curiae OMB Watch, have challenged the EPA's decision to reject closed-cycle cooling as BTA for 59 facilities on the most sensitive waterbodies in part because of OMB's participation in the rulemaking process. They contend that the EPA's action is not entitled to deference because the EPA was improperly influenced by OMB in promulgating this aspect of the Phase II Rule. The petitioners and the EPA have also sought either to strike from the record or to supplement the record with certain OMB review documents. Because we have granted the petitioners' challenge to the EPA's determination of BTA without considering OMB's role in interagency review, we do not reach the petitioner's arguments regarding OMB's involvement in the rulemaking and deny the motions to strike and to supplement as moot. *See Waterkeeper Alliance*, 399 F.3d at 524 n.34 (denying petitioners' motion to

4. *Performance Standards Expressed as Ranges*

The Phase II Rule establishes performance standards expressed as an 80 to 95 percent reduction in impingement mortality and a 60 to 90 percent reduction in entrainment, which existing power plants must achieve, subject to certain exceptions, in order to be considered in compliance with the Rule. 40 C.F.R. § 125.94(b)(1), (2). The environmental petitioners challenge the Rule's "wide and indeterminate ranges" as failing to constitute "precise single-level limitations based on the best technology available for minimizing adverse environmental impact" and argue that these ranges are inconsistent with Congress's intent that there be a national standard under section 316(b). We agree in part and, because the EPA in reconsidering its selection of BTA on remand may alter the suite of technologies it originally selected, thereby causing a coordinate alteration in the performance ranges, we provide some guidance to the EPA insofar as the petitioners' challenge touches on the limits of the Agency's authority. Although the EPA may, in the circumstances to be discussed, set performance standards as ranges, it must **[34]** require facilities to minimize the adverse environmental impacts attributable to their cooling water intake structures to the best degree they can.

The petitioners note that the EPA has found that certain screens and filter systems can reduce impingement mortality by up to 99 percent and that

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supplement the record with OMB review documents as moot where the Court granted the petitions without considering the OMB review documents).

similar technologies can produce 80 to 90 percent reduction in entrainment. 69 Fed. Reg. at 41,599. They contend that the CWA therefore requires the EPA to set BTA standards reflecting these best performers, *see Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 928 (5th Cir. 1998) ("Congress intended these [BAT] limitations to be based on the performance of the single best-performing plant in an industrial field."(citation and internal quotation **[*106]** marks omitted)), particularly given the EPA's acknowledgment that "[t]he higher end of the range is a percent reduction that available data show many facilities can and have achieved with the available technologies upon which the performance standards are based." 69 Fed. Reg. at 41,600. The petitioners emphasize that the Rule's ranges impermissibly fail to require facilities even to attempt to achieve performance equal to the upper bound of the prescribed ranges.

According to the EPA, section 316(b) does not require a single-numeric standard applicable to all Phase II existing facilities, and expressing the performance standards as ranges is necessary to account for the variables involved in reducing impingement mortality and entrainment under local conditions at particular facilities. The EPA contends that "[b]ecause the Phase II requirements are applied in a variety of settings and to existing facilities of different types and sizes, no single technology is most effective for all facilities subject to the Rule." The Agency argues that the technologies do not provide a fixed level of performance at all facilities and that their performance is affected by the nature of the waterbody, facility intake **[35]** requirements, climatic conditions, and the

waterbody's biology. The EPA argues also that the permit process requires facilities to reduce impingement mortality and entrainment commensurate with the efficacy of the installed technologies, which it claims ensures that the installed technologies will be maintained to ensure their utmost efficacy.[19] The difficulty with the EPA's arguments is that the Rule does not require facilities to choose technologies that produce the greatest reduction possible.

Our decision in *Riverkeeper I* sheds some light on the parties' arguments. In that case, we discussed the differences between the two tracks in the Phase I Rule: Track I set forth precise velocity and capacity requirements while Track II permitted compliance via technologies that would achieve at least 90 percent of the reduction in impingement mortality and entrainment that compliance with Track I would yield. *See*358 F.3d at 182–83. The petitioners in that case challenged the Track II provision on the ground that it deviated from the statutory requirement that the EPA establish a single level of performance applicable to all facilities. *Id.* at 187. The EPA argued that Tracks I and II reflected the same standard and that 10 percent is an acceptable margin of error given that measurements of reduction of impingement mortality and entrainment

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[19] The specific provision requires that when a facility's permit expires, any reissued permit must contain a requirement that "the facility . . . reduce impingement mortality and entrainment . . . commensurate with the efficacy at the facility of the installed design and construction technologies, operational measures, and/or restoration measures." 40 C.F.R. § 125.98(b)(1)(iii).

are necessarily inexact and depend upon natural fluctuations in animal populations and sampling errors. *Id.* at 188. In assessing the parties' arguments, we stated that "the EPA, consistent with Congress's intention that there be a national standard governing the discharge of pollutants, must **[36]** promulgate *precise effluent limitations* under sections 301 and 306 . . . ." *Id.* (emphasis added). We went on to note, however, that while pollutant concentration and the velocity and volume of water withdrawn can be measured accurately, impingement mortality and entrainment "cannot always be measured directly and with mathematical precision." *Id.* at 189. We concluded that the EPA acted reasonably in specifying "how much ambiguity it is willing to tolerate in measuring compliance and what it considers a reasonable **[*107]** margin of error in comparing the performance of different technologies." *Id.* In short, we acknowledged that the Track II performance requirements, unlike the Track I requirements, could not be measured precisely and that it was therefore reasonable to consider a margin of error in comparing performance under the two standards.

This case is not entirely similar to *Riverkeeper I* because of the rationales that animate the EPA's creation of the performance ranges in Phases I and II. The Phase II Rule generally requires facilities to reduce impingement mortality and entrainment by the specified percent ranges from the calculation baseline. 40 C.F.R. § 125.94(b). These ranges, as explained by the EPA, are based on the reductions achievable by using various technologies. *See* 69 Fed. Reg. at 41,599. The EPA explained that it expressed the performance standards "in the form of

ranges rather than a single performance benchmark because of the uncertainty inherent in predicting the efficacy of any one of these technologies." *Id.* at 41,600. It stated further that the lower end of the range is the percent reduction it "expects all facilities could eventually achieve if they were to implement and optimize available design and construction technologies and operational measures on which the performance standards are based" and that the higher end of the range "is a percent reduction that available data show many facilities can and have achieved **[37]** with the available technologies upon which the performance standards are based." *Id.* Unlike *Riverkeeper I*, therefore, a margin of error from a relatively precise benchmark that is tolerable given measurement difficulties is not at issue here. Instead, the performance standards reflect the range of performance associated with various technologies identified as BTA. That performance, in turn, depends in part on local conditions and natural fluctuations. *Id.*

Record evidence supports the EPA's conclusion that the percent reduction of impingement mortality and entrainment is not completely within the control of a facility and therefore may not be precisely achieved by a facility. *See* TDD for the Final § 316(b) Phase II Existing Facilities Rule 4-3. Reducing these adverse environmental impacts is not as easily measured and controlled as are the discharge of pollutants and the capacity and flow rate of water intake.[20] We therefore acknowledge that in many

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[20] Nothing in *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620 (2d Cir. 1976), suggests the contrary. While we did announce in that case that performance ranges did not comport

cases it may be difficult, as a practical matter, for the EPA or other permitting authority to predict which plants will be able to achieve the upper, as opposed to the lower, end of the ranges. This uncertainty, however, does not justify a rule that permits even those facilities that could achieve the upper end of a range to be deemed in compliance if they reach only the lower end, particularly when the EPA has acknowledged that many facilities "can and have" achieved reductions at the high end of the range. 69 Fed. Reg. at 41,600. Congress's use of the superlative "best" in the statute cannot be read to mean that a facility that achieves the lower end of the ranges, but could do better, has complied with the law. **[37]** The statutory directive requiring facilities to adopt the *best* technology cannot be construed to permit a facility to take measures **[*108]** that produce second-best results, *see Chevron*, 467 U.S. at 843, especially given the technology-forcing imperative behind the Act, *Natural Res. Def. Council*, 822 F.2d at 123. Insofar as the EPA establishes performance standards instead of requiring facilities to adopt particular technologies, it must require facilities to choose the technology that permits them to achieve as much reduction of adverse environmental impacts as is technologically possible.[21] For this reason, the EPA on remand

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with the effluent limitations established by the CWA, *id.* at 630, the discharge limitations at issue there were easily measured, unlike the reductions in impingement and entrainment at issue in both this case and *Riverkeeper I*, which "cannot always be measured directly and with mathematical precision." *Riverkeeper I*, 358 F.3d at 189.

[21] Although it may be difficult to know ex ante which plants can achieve the upper end of the range, this is at least in part

should address these concerns if in its BTA determination, it retains performance ranges.

B. *Restoration Measures*

The Phase II Rule allows a facility to meet the national performance standards set **[39]** forth in 40 C.F.R. § 125.94(b) through the use of restoration measures such as restocking fish killed by a cooling

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because the technologies preferred by the EPA are somewhat new and untested. In future permitting cycles, permitting authorities will be likely to have a clearer notion of which facilities can feasibly achieve the upper end of the range.

Finally, the upper end of the range established by the EPA, should it retain this provision on remand, should not be set at a level that many facilities "have achieved" with the installation of one or more of the technologies determined to be BTA but, as we noted earlier, at the best possible level of impingement and entrainment reduction the EPA determines these technologies can achieve. *See, e.g., Kennecott*, 780 F.2d at 448 ("In setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible."). If, at a particular Phase II facility, the adoption of BTA technologies can achieve a 95% reduction in entrainment and impingement, it is unclear why, under our jurisprudence and the clear dictates of the CWA, the EPA could establish a performance standard that has placed the ceiling at the 90% threshold which "many" Phase II facilities "can and have" achieved with the same technology. *See Am. Iron & Steel Institute v. EPA*, 526 F.2d 1027, 1051 (3d Cir. 1975) ("It will be sufficient, for the purpose of setting the level of control under available technology, that there be one operating facility which demonstrates that the level can be achieved.") (internal quotation marks and citations omitted). This would not require every Phase II facility to meet the upper end of the ranges, but only that each Phase II facility achieve the highest reduction it can with the installation of technologies determined by the EPA to be BTA. The performance ranges, if retained on remand, should accordingly reflect this understanding.

water system and improving the habitat surrounding the intake structure in order, as the EPA explains, "to provide additional flexibility to facilities in complying with the rule by eliminating or significantly offsetting the adverse environmental impact caused by the operation of a cooling water intake structure." 69 Fed. Reg. at 41,609; 40 C.F.R. § 125.94(c). The state and environmental petitioners contend that the EPA exceeded its authority by allowing compliance with section 316(b) through restoration measures because *Riverkeeper I* held that the statute's meaning is plain and that restoration measures cannot substitute for the "best technology available for minimizing adverse environmental impact" in cooling water intake structures. The EPA contends that its interpretation of the statute to permit restoration measures as a means of compliance is entitled to deference because it defined certain statutory terms in the Phase II Rule that it had not defined in the Phase I Rule. The EPA also relies on the Supreme Court's holding in *National Cable & Telecommunications Association v. Brand X Internet Services*, 545 U.S. 967, 125 S. Ct. 2688, 162 L. Ed. 2d 820 (2005), and our statement in *Riverkeeper I* limiting the decision's reach to the Phase I Rule, to argue that our prior interpretation of the statute does not **[*109]** trump the Agency's construction. We agree with the petitioners that *Riverkeeper I* held that the Agency's decision to permit restoration measures in the Phase I Rule was not "based on a permissible construction of the statute," *Chevron*, 467 U.S. at 843, 104 S. Ct. 2778, and that this holding applies equally here.

We began *Riverkeeper I* by noting that we were remanding the Phase I restoration provision because

it "contradicts Congress's clearly expressed intent." 358 F.3d at 181. We went on to state that "however beneficial to the environment, [restoration measures] have nothing to do with the location, the design, the construction, or the capacity of cooling water intake **[40]** structures, because they are unrelated to the structures themselves." *Id.* at 189. "Restoration measures *correct* for the adverse environmental impacts of impingement and entrainment," we noted, but "they do not *minimize* those impacts in the first place." *Id.* (emphasis added). For this reason and others, we concluded in *Riverkeeper I* that the EPA had exceeded its authority in promulgating the Phase I Rule by allowing compliance with section 316(b) through restoration measures because this Rule was "plainly inconsistent" with the statute's text and Congress's intent. *Id.* at 189, 191.

The EPA's argument that *Riverkeeper I* is not binding on this issue here has three components. First, the EPA contends that our rejection of the restoration measures at issue in *Riverkeeper I* did not turn on the statute's text, but instead was based on various other indicators of Congressional intent. The Agency makes much of *Riverkeeper I's* brief discussion of Congress's rejection of a proposed amendment to section 316(b) that would have explicitly allowed restoration measures and of the EPA's support of that amendment because in its opinion, the existing language did not authorize restoration measures. *Id.* at 190–91. Second, the EPA argues that its interpretation of section 316(b) in the Phase II Rule is entitled to deference because the Rule defined certain statutory terms it had not defined in the previous rulemaking phase and that its reasonable interpretation of these terms is

entitled to deference. Specifically, the Agency "defined" three statutory terms in the preamble: it (1) read the phrase "minimiz[e] adverse environmental impact" to let facilities "minimize adverse environmental impact by reducing impingement and entrainment, or to minimize adverse environmental impact by compensating for those impacts after the fact," 69 Fed. Reg. at 41,628; (2) interpreted "reflect" to authorize it to consider the full range of technologies, including restoration measures, that **[41]** minimize adverse environmental impact; and (3) viewed "restoration measures as part of the 'design' of a cooling water intake structure," and "one of several technologies that may be employed . . . to minimize adverse environmental impact,"69 Fed. Reg. at 41,637. Finally, the EPA relies on our statement in *Riverkeeper I* that our ruling on the Phase I Rule was not meant to "predetermine the factors and standard[s] applicable to Phases II and III of the rulemaking,"358 F.3d at 186 n.13, and on the Supreme Court's holding in *Brand X* that "[a] court's prior judicial construction of a statute trumps an agency construction otherwise entitled to *Chevron* deference only if the prior court decision holds that its construction follows from the unambiguous terms of the statute and thus leaves no room for agency discretion." 545 U.S. at 982, 125 S. Ct. at 2700.

We reject each of the EPA's contentions. First, our primary conclusion in *Riverkeeper I* was that restoration measures are "plainly inconsistent" with the statute's text, 358 F.3d at 189, and our statements regarding the legislative history **[*110]** of a proposed amendment, which we offered as ancillary, but not dispositive, support for our

construction of the statute, in no way diminish the force of our conclusion that Congress unambiguously expressed its intent in the statute. *See Chevron*, 467 U.S. at 842–43, 104 S. Ct. 2778 ("If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress."). Second, as to the EPA's claim that its construction of the statute is entitled to deference because it has now interpreted certain statutory terms, our holding in *Riverkeeper I* was and remains clear: restoration measures contradict the unambiguous language of section 316(b). The EPA's promulgation of the Phase II Rule obviously did nothing to alter the text of section 316(b), and the Agency cannot create ambiguity where none otherwise exists by defining statutory terms contrary to their plain meaning. Finally, as the foregoing analysis **[42]** suggests, our decision in *Riverkeeper I* foreclosed the EPA from interpreting section 316(b) in the Phase II Rule to permit restoration measures as a means of complying with the statute, and, therefore, nothing in *Brand X* undermines the precedential value of our prior holding. Our statement in *Riverkeeper I* that we did not "mean to predetermine the factors and standard applicable to Phases II and III of the rulemaking," was made in the narrow context of identifying "one reasonable reading" of particular statutory language relating to the standard for new and existing sources, not the restoration measures. 358 F.3d at 186 n. 13. Where we held that the statutory language is unambiguous, *Riverkeeper I* is binding.

Even assuming arguendo that we did not consider ourselves bound by *Riverkeeper I*, we are persuaded

by its reasoning as applied here. Restoration measures are not part of the location, design, construction, or capacity of cooling water intake structures, *Riverkeeper I*, 358 F.3d at 189, and a rule permitting compliance with the statute through restoration measures allows facilities to avoid adopting *any* cooling water intake structure technology at all, in contravention of the Act's clear language as well as its technology-forcing principle. As we noted in *Riverkeeper I*, restoration measures substitute after-the-fact compensation for adverse environmental impacts that have already occurred for the minimization of those impacts in the first instance. *Id.* The Agency's attempt to define the word "minimize" to include "compensati[on] . . . after the fact," 69 Fed. Reg. at 41,628, is simply inconsistent with that word's dictionary definition: "to reduce to the smallest possible extent," Webster's Third New Int'l Dictionary 1438 (1986).

Accordingly, the EPA impermissibly construed the statute by allowing compliance with section 316(b) via restoration measures, and we remand that aspect of the Rule.

[43] C. *Site-Specific Compliance Alternatives*

As noted earlier, the Phase II Rule includes two site-specific compliance alternatives or variances from the generally applicable requirements. The cost-cost alternative authorizes a site-specific determination that "data specific to [a] facility demonstrate that the costs of compliance under . . . this section would be significantly greater than the costs considered by the Administrator . . . in establishing the applicable performance standards," 40 C.F.R. § 125.94(a)(5)(i), while the cost-benefit

alternative authorizes a site-specific determination that "data specific to [a] facility demonstrate that the costs of compliance under . . . this section would be **[*111]** significantly greater than the benefits of complying with the applicable performance standards." *Id.* § 125.94(a)(5)(ii). If a facility makes either showing, the permitting authority "must make a site-specific determination of the best technology available" and impose "site-specific alternative requirements" that are "as close as practicable to the applicable performance standards." *Id.* § 125.94(a)(5)(i), (ii).

Petitioners challenge the cost-cost compliance alternative because, *inter alia,* they claim as a threshold matter that the Agency failed to comply with the APA's notice and comment requirements by disclosing cost data for specific facilities that would be used in determining whether a facility qualifies for the cost-cost compliance alternative only at the time the final Rule was issued. Petitioners also challenge the cost-benefit compliance alternative on two substantive grounds. They contend that this alternative (1) impermissibly allows compliance with the statute to be based on cost-benefit analysis and (2) is analogous to a water-quality standard, which the Act permits only for thermal pollution. CWA § 316(a), 33 U.S.C. § 1326(a). We address each **[44]** of these arguments in turn.[22]

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[22] Section 316(b) does not specifically authorize the Agency to allow variances from generally applicable requirements. In Riverkeeper I, we accepted the argument that the EPA can allow variances even in the absence of explicit statutory authority. 358 F.3d at 193. Although the statutes to which section 316(b) refers contained variance provisions, we did not

1. *Cost-Cost Compliance Alternative*

As already noted, a variance may be available to a facility pursuant to 40 C.F.R. § 125.94(a)(5)(i) if the facility's compliance costs would be "significantly greater than" the costs considered by the Agency "in establishing the applicable performance standards." This variance requires a calculation of compliance costs based on the suite of BTA technologies that the EPA has identified and promulgated in the final Rule. 69 Fed. Reg. at 41,644–46. We remand this provision because (1) the EPA did not give interested parties the requisite notice and opportunity to

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read them to require that section 316(b) permit (or by its silence prohibit) variances. Instead, we stated that

> [s]ection 316(b)'s silence with respect to variances does not . . . equal an unambiguous prohibition. In the absence of such a statutory bar, we think, consistent with precedent, that it is reasonable for the EPA to allow variances from regulations promulgated pursuant to section 316(b), for a regulatory system which allows flexibility, and a lessening of firm proscriptions in a proper case, can lend strength to the system as a whole.

Id. at 193 (citation and internal quotation marks omitted).

Riverkeeper I thus rejected the view that the EPA's authority to grant a variance from the generally applicable requirements of a rule promulgated pursuant to section 316(b) derives from the statutory variance provisions in other sections of the Act. Instead, *Riverkeeper I* found that the variance provision would not be authorized if it left alternative requirements to the Agency's "unfettered discretion" but would be authorized if it "guide[d] the permitting authority to consider appropriate factors and allow[ed] relaxation of the Rule's uniform technology requirements only insofar as necessary to account for unusual circumstances not considered by the Agency during its rulemaking." *Id.* at 193–94 (internal quotation marks omitted).

challenge the variance by failing to identify cost data for actual, named facilities, as opposed to model facilities, until after the notice and comment period had ended, *Sprint Corp.*, 315 F.3d at **[45]** 371, and (2) the variance is expressly premised on the validity of the BTA determination,[23] **[*112]** which itself has been remanded for further explanation, *see, e.g.*, *Solite Corp. v. U.S. EPA*, 952 F.2d 473, 494–95 (D.C. Cir. 1991) (remanding rule where the underlying grounds for its promulgation had been remanded to the EPA for procedural defects); *cf. Chenery*, 318 U.S. at 87–88 (a rule may only be upheld on the grounds that the agency proffers).

In the Rule's proposal, the EPA indicated that it had estimated compliance costs for 539 "model plants" based on factors such as "fuel source, mode of electricity generation, existing intake technologies, waterbody type, geographic location, and intake flow." 67 Fed. Reg. at 17,144. An accompanying technical development document set forth the Agency's cost calculation methodology for these model plants and listed the compliance cost estimates for each of the 539 model plants. The proposal indicated that a facility must "determine which model plant [it] most closely" resembles in order to identify the costs considered by the Agency in establishing the national performance standards.

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[23] This variance requires a comparison between the actual costs of compliance and those contemplated by EPA under the Rule. Because the Agency has calculated the costs it believes specific facilities will incur in adopting the appropriate BTA technologies (as currently defined) and then promulgated these costs in the final Rule, any change in the selection of BTA on remand will necessarily alter these costs.

See id. The EPA subsequently published in the Federal Register a so-called Notice of Data Availability ("NODA") in which it explained that it had changed its methodology for estimating the model plants' compliance costs. *Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Notice of Data Availability; Proposed Rule*, 68 Fed. Reg. 13,522, 13,527 (Mar. 19, 2003). Accompanying documents explained in greater detail the costing methodology and cost data underlying the revised approach. The revised proposal, however, did not depart from the **[46]** "model plant" approach. The final Rule, by contrast, assigned cost estimates to specific, named facilities rather than model facilities. 69 Fed. Reg. at 41,670–82. The Agency explained in the preamble to the final Rule that the EPA will adjust facility-specific costs pursuant to a multiple-step calculation formula to arrive at a final estimated cost the EPA considers a comparison for purposes of the cost-cost variance. *Id.* at 41,644–47.

The EPA acknowledges that it did not disclose in the proposal or the NODA specific facility names in connection with cost data and explains that it failed to do so because it needed to protect certain confidential business information ("CBI") and had not developed during the proposal stage a means to protect that information while still providing cost data to the public. We accept the EPA's argument that masking the facility names did not prevent interested parties from commenting on the methodology and general cost data underlying the EPA's approach because the NODA explained the costing methodology and because the general cost data, while not identified by the Agency as relating to

actual, specific facilities, was made available to interested parties. *Nat'l Wildlife Fed.*, 286 F.3d at 564–65 (holding that the EPA cannot be faulted for lack of notice in not releasing CBI data). We are persuaded, however, that the release of information and request for comments on the EPA's new approach to developing compliance cost modules via the NODA did not afford adequate notice of the costs associated with specific facilities promulgated in the final Rule.

We have previously stated that "[n]otice is said not only to improve the quality of rulemaking through exposure of a proposed rule to comment, but also to provide fairness to interested parties and **[*113]** to enhance judicial review by the development of a record through the commentary process." *Nat'l Black Media Coalition v. FCC*, 791 F.2d 1016, 1022 (2d Cir. 1986).

[47] "While a final rule need not be an exact replica of the rule proposed in the Notice, the final rule must be a 'logical outgrowth' of the rule proposed." *Id.* "The test that has been set forth is whether the agency's notice would fairly apprise interested persons of the subjects and issues" of the rulemaking. *Id.* (citation and internal quotation marks omitted).[21] Agencies accordingly are not

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[21] The D.C. Circuit has phrased the test somewhat differently, stating that "[w]hether the 'logical outgrowth' test is satisfied depends on whether the affected party 'should have anticipated' the agency's final course in light of the initial notice." *Covad Comms. Co. v. FCC*, 450 F.3d 528, 548 (D.C. Cir. 2006) (citation omitted). It has also indicated that "[t]he 'logical outgrowth' doctrine does not extend to a final rule that finds no roots in the agency's proposal because something is not a logical

permitted "to use the rulemaking process to pull a surprise switcheroo." *Envtl. Integrity Project*, 425 F.3d at 996.

Here, only the final Rule identified facilities by name in estimating compliance costs. Interested parties therefore could not comment on the basis for particular facilities' cost figures that the EPA established. This is problematic because the availability of a variance turns on the relationship between the costs estimated in the Rule and those that a specific facility establishes in a permit proceeding. The EPA focuses on the notice it gave of its intended methodology for calculating the costs the Agency considered, but ignores the overriding importance of the cost estimates for a particular facility in determining whether a *site-specific* cost-cost variance is appropriate. Thus, the EPA should have afforded notice and an opportunity to challenge the cost estimates for specific facilities and not simply an opportunity to comment **[48]** on the EPA's methodology and general cost data.[25] We remand

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outgrowth of nothing, nor does it apply where interested parties would have had to divine the agency's unspoken thoughts because the final rule was surprisingly distant from the Agency's proposal." *Envtl. Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005) (citations, internal quotation marks, and alteration omitted).

[25] Because we remand on this procedural ground, we do not consider the provision on the merits. We presume that after comment on remand, however, the EPA will reevaluate the merits of the cost-cost variance provision, particularly in light of any reevaluation of BTA in which the Agency may engage. While we do not decide the issue here, we note our discomfort with the "significantly greater than" standard of 40 C.F.R. § 125.94(a)(5)(i), given the historical applicability of a "wholly

this variance for inadequate notice and because of our remand of the BTA determination.

[*114] 2. *Cost-Benefit Compliance Alternative* [26]

If a facility requests that it be permitted to demonstrate compliance with the Phase II Rule through the site-specific cost-benefit provision of 40 C.F.R. § 125.94(a)(5)(ii), the facility must submit with its application a Comprehensive Cost Evaluation Study, Benefits Valuation Study, and Site Specific Technology Plan. 40 C.F.R.

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disproportionate to" standard and the use of the latter standard in the Phase I Rule. We have not found entirely persuasive the EPA's position that

> [t]his difference in standards for new and existing facilities is based on (1) the greater flexibility available to new facilities for selecting the location of their intakes and installing technologies at lower costs relative to the costs associated with retrofitting existing facilities and (2) the desire to avoid economically impracticable impacts on energy prices, production costs, and energy production that could occur if large numbers of Phase II existing facilities incurred costs that were more than "significantly greater" than but not "wholly out of proportion" to the costs in EPA's record.

68 Fed. Reg. at 13,541. The EPA would presumably consider each of these two factors in establishing BTA for existing facilities, and need not further consider them in determining whether a particular facility warrants a variance from the generally applicable BTA. Because cost is not supposed to be a paramount consideration in determining BTA, *see Riverkeeper I*, 358 F.3d at 185, the "significantly greater than" standard poses substantial concerns.

[26] In contrast to the cost-cost variance, the cost-benefit compliance alternative will not change on remand for the reconsideration of BTA. We thus reach the merits here.

§ 125.95(b)(6). As part of the Benefits Valuation Study, the facility must indicate the monetized value of commercial, recreational, and ecological benefits of compliance with the generally applicable national performance standards **[49]** as well as a qualitative assessment of any so—called "non-use" benefits that cannot be monetized. 40 C.F.R. § 125.95(b)(6)(ii)(A), (E). Ultimately, the facility must demonstrate that its compliance costs are "significantly greater than" the benefits of compliance. The petitioners contend that this alternative impermissibly focuses on cost-benefit considerations, contrary to Congress's directive, and is analogous to the kind of water-quality-based standard we found to be inconsistent with the statute in *Riverkeeper I*. 358 F.3d at 190. For both reasons, we are persuaded that the EPA exceeded its authority in permitting site-specific cost-benefit variances. In light of this conclusion, we do not reach the industry petitioners' claim that the provision impermissibly requires consideration of qualitative non-use benefits in the cost-benefit analysis.

As we discussed previously in analyzing the EPA's determination of BTA, cost-benefit analysis is not consistent with the requirement of § 316(b) that cooling water intake structures "reflect the best technology available for minimizing adverse environmental impact." Indeed, the statutory language requires that the EPA's selection of BTA be driven by technology, not cost. The Agency is therefore precluded from undertaking such cost-benefit analysis because the BTA standard represents Congress's conclusion that the costs imposed on industry in adopting the best cooling water intake structure technology available (i.e., the best-performing

technology that can be reasonably borne by the industry) are worth the benefits in reducing adverse environmental impacts. *Cf. Am. Textile Mfrs. Inst.*, 452 U.S. at 509 (noting that where Congress has defined the basic relationship between costs and benefits, a regulatory standard that strikes a different balance is inconsistent with the statute). Just as the Agency cannot determine BTA on the basis of cost-benefit analysis, it cannot authorize site-specific determinations of BTA based on cost-benefit analysis.

[50] The cost-benefit variance also impermissibly authorizes the EPA to consider the degraded quality of waterways in selecting a site-specific BTA. We stated in *Riverkeeper I* that in enacting the CWA, Congress rejected regulation by reference to water quality standards. 358 F.3d at 189–90. Before 1972, Congress "regulated point sources based on their effect on the surrounding water and allowed sources to discharge pollutants provided the discharge did not cause water quality to dip below an acceptable level." *Id.* at 189. Congress changed its approach in 1972, in part because a plaintiff attempting to prove a violation of the law faced a nearly impossible burden of showing that a particular polluter had caused the water quality to dip below the regulatory standards. *Id.* at 189–90. The Act now regulates discharges from point sources rather than **[*115]** water quality. We thus concluded in *Riverkeeper I* that water-quality standards cannot be considered under section 316(b). *Id.* at 190. Of course, "water quality" in the context of the Act is generally understood to refer to pollutant concentration. As we noted in *Riverkeeper I*, however, for purposes of section 316(b), which regulates water intake rather

than the discharge of pollutants, water quality is "measured by wildlife levels." *Id.* at 189. This analysis in *Riverkeeper I* is, thus, equally applicable here.[27]

[51] The challenged provision of the Phase II Rule apparently would permit a facility to argue that, based on water quality (i.e., the level of aquatic wildlife in a particular body of water), the cost of complying with the national performance standards is not justified. The Agency explained in the preamble to the Rule that "in a waterbody that is already degraded, very few aquatic organisms may be subject to impingement or entrainment, and the costs of retrofitting an existing cooling water intake

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[27] As the petitioners note, section 316(a) permits consideration of the quality of the receiving water for purposes of granting variances with respect to the rules concerning thermal pollution. Section 316(a) provides that the Administrator may issue a variance to the rules governing "thermal discharges" to a facility that establishes that those rules "require effluent limitations more stringent than necessary to assure the pro[t]ection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made." CWA § 316(a), 33 U.S.C. § 1326(a). As the petitioners also note, section 316(b) does not similarly permit consideration of the quality of the receiving water, and this distinction is significant. *See Russello*, 464 U.S. at 23. Moreover, as we discussed in *Riverkeeper I*, the heat-pollution provision of section 316(a) is a "notable exception" to the CWA, which "otherwise relies on limitations on what a source can put into the water, not the ultimate effect of that discharge." 358 F.3d at 190.Nothing in the statute, therefore, supports the view that the EPA can consider the quality of the receiving water in granting variances from generally applicable rules promulgated pursuant to section 316(b).

structure may be significantly greater than the benefits of doing so." 69 Fed. Reg. at 41,604. This kind of water-quality-based regulation is not authorized by the CWA because it would exempt facilities from meeting the mandated performance standards simply because wildlife levels in the waterbody were already low, and as we held in *Riverkeeper I*, the CWA does not permit the EPA to consider water quality in making BTA determinations. Finally, we note that to the extent that facilities on highly degraded waterbodies with relatively low wildlife levels face high compliance costs to achieve the national performance standards, those facilities may qualify for the cost-cost variance if such variance is retained on remand.

Because the EPA exceeded its authority under section 316(b) by permitting (1) cost-benefit analysis and (2) assessment of the quality of the receiving water (i.e., the receiving water's wildlife levels) in determining whether a variance is warranted, we do not need to defer to the Agency's construction of the statute. We therefore remand this aspect of the Rule.

D. *TIOP Provision*

The Phase II Rule's TIOP provision, 40 C.F.R. § 125.94(d), permits a facility to **[52]** comply with the national performance standards determined on the basis of whether the facility has "complied with the construction, operational, maintenance, monitoring, and adaptive management requirements of a Technology Installation and Operation Plan." *Id.* § 125.94(d)(1). The petitioners contend that this provision impermissibly allows a facility's compliance to be determined not by reference to the

performance standards themselves, but by **[*116]** evaluating whether a facility has complied with a plan to achieve the performance standards. In other words, they argue that the TIOP provision essentially allows for an unauthorized margin of error. The petitioners also argue that the EPA denied the public an opportunity to comment on the provision. Like the cost-cost compliance alternative, remand is appropriate here on two grounds: (1) the EPA did not give adequate notice regarding the provisions in section 125.94(d)(2); and (2) the record justification for the TIOP provision depends on the EPA's selection of a suite of technologies as BTA, a selection which has been remanded for further explanation. Given this, we remand the TIOP provision without reaching the merits here.

The Rule provides that during the first permit term, a facility may request that its compliance be determined based on whether it has complied with its TIOP, which must be designed to meet the performance standards, 40 C.F.R. § 125.94(d)(1), and submitted with a permit application, *id.* § 125.95(b)(4)(ii). During subsequent permit terms, if a facility has complied with its TIOP but is not meeting the performance standards, the facility may request that its compliance with the standards during the following term be based on whether it remains in compliance with its TIOP, revised in accordance with the facility's adaptive management plan. 40 C.F.R. § 125.94(d)(2). The EPA explained in the Rule's preamble that it is difficult to determine reductions in impingement mortality and entrainment relative to what would have **[53]** occurred in the absence of control technologies given natural variability and the vagaries of sampling

methods. 69 Fed. Reg. at 41,613. The EPA explained further that it established the TIOP compliance options to account for these variabilities on the ability of a technology to meet the performance standards consistently over time. *Id.* at 41,613–14.

As previously noted, a "final rule must be a 'logical outgrowth' of the rule proposed." *Nat'l Black Media Coalition*, 791 F.2d at 1022. The final rule must have roots in the proposal, *Envtl. Integrity Project*, 425 F.3d at 996, which must "fairly apprise interested persons of the subjects and issues" involved in the rulemaking, *Nat'l Black Media Coalition*, 791 F.2d at 1022. An agency cannot "pull a surprise switcheroo" on interested parties between a proposal and the issuance of a final rule. *See Envtl. Integrity Project*, 425 F.3d at 996.

Although the Rule's proposal notified interested parties that the Agency was considering a provision that would give facilities time to achieve the performance standards after implementing new technologies, the EPA gave inadequate notice of the potentially indefinite scope of this provision. Specifically, the EPA failed to provide notice of the Rule codified at 40 C.F.R. § 125.94(d)(2), which permits a facility to be deemed in compliance with the Phase II Rule in subsequent permit terms if it continues to adhere to its TIOP.

In the Rule's proposal, the EPA stated only that it was considering "the need for regulatory language that would allow facilities time to come into compliance [with the performance standards] if they choose to install technologies to meet the performance standards." 68 Fed. Reg. at 13,586.

The proposal indicated further that the EPA was "evaluating and considering allowing six months, one year, two years, or five years (one permit term) for a facility to come into compliance after issuance of its permit." *Id.* The TIOP provision in the **[54]** final Rule, by contrast, does not simply allow facilities additional time, up to one permit term, to come into compliance with the performance standards. Instead, it appears to permit a facility to satisfy the **[*117]** Rule's requirements in subsequent permit terms, for an indefinite period, without ever demonstrating compliance with the performance standards, so long as the facility has adhered to its TIOP. 40 C.F.R. § 125.94(d)(2) (stating that "[d]uring subsequent permit terms" a facility "may request that compliance . . . be determined based on whether [it] remain[s] in compliance with" its TIOP). This aspect of the TIOP provision appears then not to be a "logical outgrowth" of the proposal, *see Nat'l Black Media Coalition*, 791 F.2d at 1022, because interested parties would not have divined from the proposal that facilities could be given an indefinite period to come into compliance with the national performance standards.

We thus remand the rule for failure to provide notice and comment and because the record justification for the TIOP provision depends on the EPA's selection of BTA, which has been remanded.

E. *Definitions of "New Facility" and "Existing Facility"*

The environmental petitioners challenge the reclassification in the Phase II Rule preamble of certain new constructions as "existing facilities," thereby rendering them subject to the Phase II Rule

rather than the more stringent Phase I requirements that apply to new facilities. We agree with the petitioners that the Agency interpretively modified a definition appearing in the Phase I Rule via statements in the preamble to the Phase II Rule without providing interested parties notice and an opportunity for comment.

"An agency's interpretation of its own . . . regulation must be given controlling **[55]** weight unless it is plainly erroneous or inconsistent with the regulation." *Fowlkes v. Adamec*, 432 F.3d 90, 97 (2d Cir. 2005) (citations and internal quotation marks omitted). Although we typically owe considerable deference to an agency's construction of its own regulation, *Udall v. Tallman*, 380 U.S. 1, 16 "[u]nder settled principles of statutory and rule construction, a court may defer to administrative interpretations of a statute or regulation *only* when the plain meaning of the rule itself is doubtful or ambiguous, "*Pfizer, Inc. v. Heckler*, 735 F.2d 1502, 1509 (D.C. Cir. 1984) (emphasis in original). "Deference to agency interpretations is not in order if the rule's meaning is clear on its face." *Id.* Implicit in the rule that an agency cannot interpret a regulation contrary to its unambiguous meaning is the requirement that "an agency must adhere to its own rules and regulations." *Reuters Ltd. v. FCC*, 781 F.2d 946, 950 (D.C. Cir. 1986). An agency may modify a regulation that has already been promulgated, therefore, only through the process of notice and comment rulemaking. *See Alaska Prof'l Hunters Ass'n, Inc. v. FAA*, 177 F.3d 1030, 1034 (D.C. Cir. 1999); *see also* 5 U.S.C. § 551(5) (defining "rule making," which is governed by the notice and comment requirements of 5 U.S.C. § 553, as the

"agency process for formulating, amending, or repealing a rule"); *Shalala v. Guernsey Memorial Hosp.*, 514 U.S. 87, 100 (1995) (noting in dicta that APA rulemaking is required where an agency interpretation "adopt[s] a new position inconsistent with . . . existing regulations").

The Phase I Rule defined "new facility" as any structure whose construction commenced after January 17, 2002 that meets both the definition of "new source" in 40 C.F.R. § 122.29 (discussed below) *and* one of two other requirements: the structure must use either (1) "a newly constructed cooling water intake structure" or (2) "an existing cooling water intake structure whose design capacity is increased to accommodate **[*118]** the intake of additional cooling **[56]** water." *See* 40 C.F.R. § 125.83. A "new source" under section 122.29 is a facility that (1) "is constructed at a site at which no other source is located," (2) "totally replaces the process or production equipment that causes the discharge of pollutants at an existing source," or (3) undertakes "processes . . . *substantially independent* of an existing source at the same site."[28] 40 C.F.R. § 122.29(b) (emphasis added). Section 122.29(b)

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[28] The Phase I Rule defined facilities meeting either of the first two tests of section 122.29(b) as "greenfield" facilities and facilities meeting the third test as "stand-alone" facilities. 40 C.F.R. § 125.83 ("A greenfield facility is a facility that is constructed at a site at which no other source is located, or that totally replaces the process or production equipment at an existing facility. A stand-alone facility . . . is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site.").

provides further that, in determining whether a facility is "substantially independent" of an existing source, the director should consider "the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source." 40 C.F.R. § 122.29(b)(iii).

In determining whether a new construction quailfies as a "new facility" for purposes of the Phase I Rule, therefore, the permitting authority must perform a two-part, but not necessarily sequential, analysis. It must determine whether the construction uses a new cooling water intake structure or an existing structure whose capacity has been increased. The permitting authority must also determine whether the new construction qualifies as a "new source." Failure to meet either part of this analysis precludes the new construction from qualifying as a "new facility," and thus from falling under the Phase I Rule's purview.

The Phase I Rule stated that "new facilities" meeting the foregoing requirements **[57]** include a "stand-alone" facility, which the Phase I Rule defined as "a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site." *Id.* § 125.83. This is because such a facility, by definition, essentially qualifies as a "new source." *Compare id. with* § 122.29 (defining "new source" as including a facility that undertakes "processes . . . substantially independent of an existing source at the same site"). The Phase I Rule clarified, however, that "new facility" does not include "new units that are added

to a facility for purposes of the same general industrial operation (for example, a new peaking unit at an electrical generating station)." *Id.* § 125.83. This is presumably because such units do not qualify as "new sources" in that they are not substantially independent of existing sources. *See id.* § 122.29(b)(1)(iii) (setting forth the factors to be considered in determining substantial independence, including "the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source"). The Phase I Rule thus appears to have left regulation over the following to a subsequent rulemaking phase: (1) new stand-alone facilities that use existing intake structures whose design capacity is not increased and (2) new units that are added to a facility for purposes of the same general industrial operation even if they require either an increase in the intake structure design capacity or the construction of a new cooling water intake structure altogether. *Id.*[29]

[58] **[*119]** The Phase II Rule defines "existing facility" as any facility whose construction commenced on or before January 17, 2002, "and any modification of, or any addition of a unit at such a

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[29] A facility would clearly find it advantageous to classify a new construction on its grounds as one added for purposes of the same general industrial operation rather than as a stand-alone facility. A stand-alone facility is treated as an existing facility only if it uses an existing intake structure whose capacity is not increased; a "new unit," by contrast, is treated as part of an existing facility even if it requires the construction of a new intake structure or an increase in an existing intake structure's capacity.

facility that does not meet the definition of a new facility at § 125.83." *Id.* § 125.93. Thus, from this definition, it appears that new stand-alone facilities that use existing, unmodified intake structures and new units added to a facility for purposes of the same industrial operation, regardless of their impact on the facility's cooling water intake structure, (i.e., the two kinds of new constructions left unregulated by the Phase I Rule) are considered "existing facilities" and governed by the Phase II Rule.

The parties' dispute concerns statements in the preamble to the Phase II Rule that purportedly narrow, by way of interpretation, the Phase I Rule's definition of "new facility"[30] without the required procedures of notice and comment. In the preamble to the Phase II Rule, the EPA states that "the Phase I [R]ule treated almost all changes to existing facilities for purposes of the same industrial operation as existing facilities." 69 Fed. Reg. at 41,579. The preamble then appears to distinguish stand-alone facilities from new units that are part of the same industrial operation, thereby defining the latter as existing facilities without reference to the definition of "new source" or the "substantial

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[30] We find no merit to the EPA's argument that the state and environmental petitioners here are ostensibly challenging the Phase II Rule's definition of "existing facility" but are actually seeking review of the meaning of "new facility" under the Phase I Rule-for which their claim would be time-barred. Though the EPA claims that "[n]othing in the Phase II Rule altered or amended the definition of 'new facility,'" it is clear from the discussion above that the preamble to the Phase II Rule eliminates without notice or comment the analysis the Phase I Rule had required.

independence" test of 40 C.F.R. § 122.29. *Id.* at 41,579 n.2a. The preamble states that the "substantial independence" test does not apply where there is an addition to an existing facility for purposes of the same industrial operation, such as the "addition **[59]** of new generating units at the same site" as an existing facility, *id.* at 41,579, because such additions "are categorically treated as 'existing facilities' regardless of any other considerations unless they completely replace an existing facility and its cooling water design intake capacity is increased," *id.* at 41,579 n. 2a. These comments are contrary to the plain meaning of the relevant portion of the Phase I Rule.

The Phase I Rule unambiguously stated that "new facility" means any structure that is a "new source," as defined by 40 C.F.R. § 122.29, subject to certain other requirements. Under this provision, a source is considered "new" if, *inter alia*,"[i]ts processes are substantially independent of an existing source at the same site." 40 C.F.R. § 122.29(b)(1)(iii). A permitting authority could not classify a source constructed at the site of an existing source as new or existing for purposes of the Phase I Rule, therefore, without reference to the "substantial independence" test. It is plain, then, that the Phase I Rule distinguished between **[*120]** "stand-alone" facilities and "new units," where the new construction is not built at an empty site and does not totally replace an existing source, by reference to the definition of a "new source." A stand-alone facility is "substantially independent" of an existing facility, and therefore a new source; a new unit that is part of the same industrial operation as an existing facility is not substantially independent of

an existing facility, and therefore not a new source. It is impossible to determine which classification applies to a particular construction under the Phase I Rule without referring to the definition of "new source," i.e., whether it satisfies the "substantial independence" test. Put differently, the touchstone of the definition of "new facility" in the Phase I Rule is whether a source is a "new source." The Phase I Rule's plain terms thus indicate that a unit that is "substantially independent" of an existing facility is not "part of the same general industrial **[60]** operation" as the existing facility. Any elimination of the "substantial independence" inquiry, therefore, strikes at the heart of the Phase I Rule and its classification of what facilities are subject to its requirements.

The EPA claims that the Phase II Rule has in no way eliminated the "substantial independence" test and that the Rule's preamble merely makes clear that the fifth sentence in section 125.83 exempts "new units" from regulation under the Phase I Rule. This argument fails because the Phase I Rule provides no way to distinguish between stand-alone facilities and new units where the construction is built on a site where a source is already located and does not totally replace the existing source except by reference to the "substantial independence" test, i.e., without assessing the factors set forth at 40 C.F.R. § 122.29(b)(1)(iii) in order to determine whether the source is new or existing. Just as "stand-alone facility" has no intrinsic meaning, neither does "new unit." The Phase I Rule defines each by reference to the "substantial independence" test of section 122.29(b). Thus, while an existing facility can be repowered with new generating units and remain an

"existing facility" for regulatory purposes under section 316(b), the determination can only be made by reference to whether a particular new generating unit is a stand-alone facility or a new unit that is part of the same general industrial operation as an existing facility. In fact, a permitting authority must first determine whether a source is "new" within the meaning of 40 C.F.R. § 122.29(b) before it can conclude that the source is a stand-alone facility or a new unit added to an existing facility for purposes of the same general industrial operation.

Because the Phase I Rule was not ambiguous, we do not owe deference to the Agency's interpretation of the Phase I Rule in the preamble to the Phase II Rule. *See Fowlkes*, **[61]** 432 F.3d at 97; *Pfizer*, 735 F.2d at 1509. By permitting the Agency to determine that a new construction is not subject to the Phase II Rule without any definitional guidance and in contravention of the Phase I Rule, the EPA has expanded the scope of what may be classified as a "new unit" while narrowing the Phase I definition of "stand-alone" facility. Moreover, by including a potentially expansive definition of "new unit" in the preamble to the Phase II Rule, the EPA has interpretively modified the definitions that appeared in the Phase I Rule without providing interested parties an opportunity for notice and comment.

Accordingly, we direct the EPA on remand to adhere to the definitions set forth in the Phase I Rule, *see Reuters*, 781 F.2d at 950–52, or to amend those definitions following notice and comment, *see Alaska Prof'l Hunters*, 177 F.3d at 1034.

[*121] IV. *The Industry Petitioners*

A. *Applicability of Section 316(b) to Existing Facilities*

Entergy argues that the EPA lacks authority to apply CWA section 316(b) to existing, as opposed to new, facilities. We disagree and conclude that, at the very least, the EPA permissibly interpreted the statute to cover existing facilities and that its interpretation is therefore entitled to deference under *Chevron*.

Entergy's argument turns primarily on the statutory language that the best technology available be reflected in the "location, design, construction, and capacity of cooling water intake structures"—a collection of words Entergy contends indicates Congress's intent to **[62]** regulate only new facilities.[31] Entergy argues further that the EPA has

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[31] Entergy cites a number of federal statutory and regulatory provisions using similar words and argues that each provision applies only in the pre-construction context. The environmental petitioners contend that the provisions upon which Entergy relies explicitly limit their application to new facilities and that, as a result, the words "location, design, construction and capacity," standing alone, do not apply solely to new facilities; otherwise, the environmental petitioners' argument goes, there would be no need to limit expressly the provisions' applicability to new facilities. For example, 49 U.S.C. § 60103, which governs safety standards for liquefied natural gas pipelines, by its express terms does not apply to certain existing facilities. 49 U.S.C. § 60103(c) ("Except as provided in paragraph (2) of this subsection, a design, location, installation, construction, initial inspection, or initial testing standard prescribed under this chapter after March 1, 1978, does not apply to an existing liquefied natural gas pipeline facility . . . ."). These are additional reasons for the holding discussed in this opinion.

authority to approve cooling water intake structures only before construction and cannot regulate these structures through the NPDES permits issued pursuant to CWA section 402(a)(1), 33 U.S.C. § 1342(a)(1), which allows the Administrator to "issue a permit for the discharge of any pollutant," but not, in Entergy's view, to cover existing intake structures.

The EPA emphasizes that section 316(b) cross-references section 301, which applies to existing facilities, and that the Agency's historical practice of applying section 316(b) to existing facilities effectuates Congress's objectives in enacting the CWA. The EPA contends that Congress's link between effluent limitations established pursuant to section 301 and BTA under section 316(b) indicates an intent to regulate cooling water intake structures at existing facilities. The EPA thus argues that the intake-structure standard is to be applied whenever an intake structure is present at a point source of pollutant discharge, whether that point source is new or existing. As to Entergy's argument concerning the ability to assess intake structures during NPDES permitting proceedings, the EPA argues that its decision to implement the Phase II requirements through NPDES permits has a strong textual basis. It notes that section 402 **[63]** provides for the issuance of "a permit for the discharge of any pollutant" so long as the discharge meets "all applicable requirements under sections 1311 . . . [and] 1316,"sections 301 and 306 of the CWA respectively. CWA § 402(a)(1), 33 U.S.C. § 1342(a)(1). EPA contends that the Phase II requirements are "requirements under sections 1311 . . . [and] 1316" and therefore that cooling water

intake structures may be regulated via permits issued pursuant to section 402.

The EPA has the better of both arguments. As to whether section 316(b) applies to existing facilities, we find Entergy's textual argument, while superficially appealing, ultimately to be unavailing. Nothing in section 316(b) indicates that **[*122]** because it applies to the "location, design, construction, and capacity" of a facility's cooling water intake structure, the section is therefore limited to new facilities and does not require existing facilities either to modify existing intake structures or to construct new intake structures in order to come into compliance with the EPA's Rule.[32] In fact, given the cross-references in section 316(b) to provisions governing both new and existing facilities, the EPA's reading is far more reasonable than Entergy's. *See E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 121 (1977) ("Section 301(b) [to

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[32] We are not persuaded by Entergy's selective definitions of the terms "location, design, construction, and capacity." While we agree that words in a statute are to be accorded "their ordinary, contemporary, common meaning," *Harris v. Sullivan*, 968 F.2d 263, 265 (2d Cir. 1992), it is clear that the EPA's interpretation of the statute does not deviate from this requirement. *See, e.g.*, Black's Law Dictionary 958 (8th ed. 1999) ("[L]ocation" is "[t]he specific place or position of a person or thing."); *id.* at 478 ("[D]esign" means "a plan or scheme" or "[t]he pattern or configuration of elements in something."); *id.* at 332 ("[C]onstruction" is "[t]he act of building," but also "the thing so built."); Webster's Third New Int'l Dictionary 330 (1986) ("[C]apacity" means "the power or ability to hold, receive or accommodate" and "a containing space: a measure of content for gas, liquid, or solid."). Nothing in the above definitions suggests the EPA could not have reasonably interpreted such words to include existing facilities.

which section 316(b) expressly refers] defines the effluent limitations that shall be **[64]** achieved by existing point sources . . . ."); *id.* at 136, 97 S. Ct. 965 (holding that "301 does authorize the [Agency] to promulgate effluent limitations for classes and categories of existing point sources"). The cross-reference to section 301 is particularly significant given that Congress, having made this explicit cross-reference, did not then limit section 316(b)'s application to new facilities—which would have been a simple task to do. At the very least, the EPA's view that section 316(b) applies to existing facilities is a reasonable interpretation of the statute, and we therefore accord it deference. *See Chevron*, 467 U.S. at 842–43.

Entergy's argument concerning the permitting process presents a closer question, but it is ultimately not persuasive and does not undermine our conclusion that section 316(b), on its face, applies to existing facilities. The textual basis for the EPA to regulate cooling water intake structures during the periodic permitting process applicable to the discharge of pollutants is not immediately apparent. Section 402 conditions the issuance of a permit on the circumstance that a "*discharge* will meet . . . all applicable requirements under sections 1311 . . . [and] 1316." CWA § 402(a)(1), 33 U.S.C. § 1342(a)(1) (emphasis added). While the Phase II requirements are "requirements" under sections 301 and 306, they do not apply to the discharge of pollutants, and section 402 says nothing about conditioning a permit on compliance with *other* requirements of sections 301 and 306, i.e., requirements not relating to the discharge of pollutants. Despite this textual hiccup, the EPA's

decision to use the NPDES process to enforce section 316(b) is not unreasonable. Insofar as the provision applies to existing facilities—and the cross-reference in section 316(b) to section 301 provides a clear textual basis for that conclusion—the EPA could enforce it only through some permit process following the issuance of an initial construction permit. Moreover, the structure of section 316(b) supports the view that its requirements are to **[65]** be enforced through the same process used to enforce the effluent limitations of sections 301 and 306. As noted, the statute requires that any standard established by the EPA to govern the discharge **[*123]** of pollutants from existing facilities must also regulate cooling water intake structures. CWA § 316(b), 33 U.S.C. § 1326(b) (providing that "[a]ny standard established pursuant to section 1311 . . . or section 1316" shall also regulate the cooling water intake structures of point sources). In light of this language, it is at least reasonable to conclude that Congress intended the requirements of section 316(b) to be part and parcel of any regulation of, and therefore any permit issuance relating to, the discharge of pollutants. *See Riverkeeper I*, 358 F.3d at 185–86. It is a fair conclusion that section 402 implicitly requires permitting authorities to ensure compliance with section 316(b) as a permit condition. *See U.S. Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977) ("[Section] 402(a)(1) implicitly requires the Administrator to insure compliance with § 316(b) as one of the permit conditions."), *overruled on other grounds by City of West Chicago, Ill. v. U.S. Nuclear Regulatory Comm'n*, 701 F.2d 632, 644 (7th Cir. 1983) (abandoning the view that 5 U.S.C. § 558(c) independently provides that formal adjudicatory

hearings must be held when requested by a license applicant under CWA § 402). Section 402 thus does not undermine the deference to which the Agency's interpretation of section 316(b) is entitled under *Chevron*.

Because section 316(b) plainly applies to existing facilities and Congress intended the requirements of section 316(b) to apply in tandem with the effluent limitations established pursuant to sections 301 and 306, we conclude that the EPA may regulate cooling water intake structures via the NPDES permit process. Otherwise, Congress's intent to regulate the intake **[66]** structures of existing facilities could not be effectuated.[33] Accordingly, we reject this aspect of Entergy's challenge.

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[33] Entergy also contends that section 316(b) cannot be enforced via a citizen suit pursuant to section 505(a)(1), 33 U.S.C. § 1365(a)(1), because that provision covers only violations of "an effluent standard or limitation" or "an order issued by the Administrator or a State with respect to such a standard or limitation," and that the statute therefore applies only in the pre-construction context. Because the case before us is not a citizen suit, we are not directly presented with the question of whether a citizen can sue to enforce section 316(b) and do not decide the question. We are not, however, persuaded by Entergy's argument. The citizen suit provision states that a citizen may commence a suit against any person who is alleged to be in violation of "an effluent standard or limitation under this chapter." CWA § 505(a)(1), 33 U.S.C. § 1365(a)(1). Viewed in light of this language alone, it is difficult to characterize a violation of regulations promulgated pursuant to section 316(b) as a violation of an "effluent standard or limitation." The statute, however, defines "effluent standard or limitation" to include "an effluent limitation or other limitation under section 1311" and a "standard of performance under section 1316." CWA § 505(f), 33 U.S.C.

B. *Definition of "Adverse Environmental Impact"*

In the Phase II Rule, as in the Phase I Rule, the EPA has interpreted the statutory directive of section 316(b) to minimize "adverse environmental impact" ("AEI") to require the reduction of "the number of aquatic organisms lost as a result of water withdrawals associated" with cooling water intake structures. 69 Fed. Reg. at 41,586. This interpretation **[*124]** reflects the fact that section 316(b) is a somewhat unusual provision of the CWA in that it governs the environmental effects of large scale withdrawals from waters of the United States rather than the release of pollutants into receiving water. As did the industry petitioners in *Riverkeeper I*, PSEG argues that the EPA arbitrarily defined AEI to include any loss of or harm to aquatic organisms **[67]** due to impingement mortality and entrainment rather than only more severe "population-level effects." It contends that the EPA has historically focused on the "population dynamics" of aquatic organisms and the fact that many of these organisms are "density dependent," i.e., they produce large numbers of offspring, only a few of which survive to adulthood.[34] On the theory that the "vast majority"

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§ 1365(f). Arguably, therefore, a limitation established pursuant to section 316(b) is an "other limitation under section 1311" and a "standard of performance under section 1316," given the cross-reference to sections 301 and 306 in section 316(b), and thus falls within the scope of the citizen-suit provision. While we do not decide the question here, we do not read the citizen suit provision to undermine the deference we accord the EPA's reasonable interpretation pursuant to *Chevron* that section 316(b) applies to existing facilities.

[34] PSEG relies on the Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the

of entrained organisms would have died of natural causes in any event, PSEG argues that reduction of impingement mortality and entrainment will have only a marginal positive environmental impact.[35] PSEG contends that because the Agency has changed course from its longstanding interpretation of AEI without giving a clear and reasoned justification for its decision, the EPA's Rule is entitled to less deference than it otherwise would receive. PSEG also argues that the Phase II Rule's exclusion from the entrainment-reduction requirement of facilities withdrawing small amounts of water, facilities withdrawing water from lakes other than the Great Lakes, and facilities that have

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Aquatic Environment, prepared by the EPA in 1977. While the EPA indicated in this document that "[a]dverse environmental impacts occur whenever there will be entrainment or impingement damage as a result of the operation of a specific cooling water intake structure," PSEG focuses on the Agency's statement that the "critical question" is "the magnitude of any adverse impact."

[35] The environmental petitioners contend that PSEG has missed the mark here entirely. They argue that when organisms die of natural causes they remain available as food for top predators, but that when organisms are entrained, and potentially disintegrated, they are consumed by lower organisms. They argue also that entrained organisms are not available to consume organisms lower on the food chain. The environmental petitioners thus contend that one of the primary adverse environmental impacts of impingement mortality and entrainment is their effect on the ecosystem as a whole by disrupting the food chain. The EPA discussed these and other environmental impacts attributable to impingement mortality and entrainment in the preamble to the Phase II Rule, concluding that "[d]ecreased numbers of aquatic organisms can disrupt aquatic food webs and alter species composition and overall levels of biodiversity." 69 Fed. Reg. at 41,586.

a small capacity utilization rate undercuts the EPA's **[68]** determination that impingement mortality and entrainment are *per se* adverse environmental impacts. We are not persuaded by PSEG's arguments.

We agree with the EPA that the Phase II Rule is based on substantially the same record evidence of impingement mortality and entrainment relied upon in promulgating the Phase I Rule and that we rejected substantially the same arguments advanced here by the industry petitioners in *Riverkeeper I*, 358 F.3d at 197 ("The EPA considered all of the factors that UWAG now raises, and we are inclined to defer to the EPA's judgment of how best to define and minimize 'adverse environmental impact.' " (internal footnote omitted)). *Riverkeeper I* thus controls this issue.

In *Riverkeeper I*, we rejected the arguments that some species are nuisances and require eradication, that other species respond to population losses by increasing their reproduction, and that removing large numbers of aquatic organisms from waterbodies is not in and of itself an adverse **[*125]** impact. 358 F.3d at 196. We specifically rejected the view that "the EPA should only have sought to regulate impingement and entrainment where they have deleterious effects on the overall fish and shellfish populations in the ecosystem, which can only be determined through a case-by-case, site-specific regulatory regime." *Id.* We emphasized that "the EPA's focus on the number of organisms killed or injured by cooling water intake structures is eminently reasonable." *Id.* We reiterated that Congress had "rejected a regulatory approach that

relies on water quality standards," analogizing the argument pressed there as urging what is essentially a water quality standard that focuses on fish populations and consequential **[69]** environmental harm.[36] *Id.* at 196–97. Given that the record evidence on this issue has not changed in any meaningful way since the Phase I rulemaking, we are both persuaded and bound by our statements on this issue in *Riverkeeper I*.

Were we considering the issue in the first instance, however, we would be inclined to defer to the EPA's judgment in any event. The EPA explained that it has set "performance standards for minimizing adverse environmental impact based on a relatively easy to measure and certain metric-reduction of impingement mortality and entrainment." 69 Fed. Reg. at 41,600. It explained further that it chose this

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[36] We make an additional observation here, which we cited in *Riverkeeper I* as a reason for rejecting restoration measures as impermissible under the statute. It is significant that in section 316(a), which governs thermal discharges, Congress permits the EPA to vary the standard applicable to a point source "by considering the particular receiving waterbody's capacity to dissipate the heat and preserve a 'balanced, indigenous' wildlife population." 358 F.3d at 190. It is also significant that Congress "did not include that [water quality or population level] approach (or make any reference to it) in the very next subsection," *id.*, since "where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion." *Id.* (quoting *Bates v. United States*, 522 U.S. 23, 29-30 (1997) (internal quotation marks omitted)). The statutory structure thus indicates that Congress did not intend to limit "adverse environmental impact" in section 316(b) to population-level effects.

approach "because impingement and entrainment are primary, harmful environmental effects that can be reduced through the use of specific technologies" and stated that "where other impacts at the population, community, and ecosystem levels exist, these will also be reduced by reducing impingement and mortality." *Id.* We see no reason to second-guess this judgment, given the Agency's consideration of the various environmental consequences of cooling water intake structures. *See Nat'l Wildlife Fed'n*, 286 F.3d at 570 (noting that courts afford the EPA considerable discretion to weigh and balance **[70]** various factors in determining how to establish performance standards).[37]

[*126] C. *Zero Entrainment Survival Assumption*

The Phase II Rule requires a reduction of impingement *mortality*, but a reduction of entrainment *generally*. *See*40 C.F.R. § 125.94(b). The industry petitioners contend that the EPA

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[37] We also find no merit in PSEG's claim that the final Rule gave no notice of the supposed change in the EPA's view of "adverse environmental impact." Not only did the proposed Rule seek comment on several competing definitions, one of which referred to gauging such impact in part by examination of the "absolute damage" wrought by impingement and entrainment, but in which the EPA noted that "there will be adverse environmental impact whenever there is entrainment or impingement 'damage' as a result of a cooling water intake structure." 67 Fed. Reg. at 17,162. While the EPA did not ultimately adopt any of the definitions it noticed, it is clear that PSEG was "fairly apprise[d]" that the EPA was considering an approach to AEI that looked to entrainment and impingement at the individual level. *Nat'l Black Media Coalition*, 791 F.2d at 1022.

improperly presumed that all entrained organisms are killed. They argue that the Rule's assumption that no organisms survive entrainment is contrary to the evidence which, in their view, indicates a survival rate of significantly more than zero. We conclude that in light of uncertain record evidence, the EPA acted within its discretion in assuming zero entrainment survival.

The EPA explained in the preamble to the Phase II Rule that it assumed zero percent entrainment survival because it "does not have sufficient data to establish performance standards based on entrainment survival for the technologies used as the basis for today's rule." 69 Fed. Reg. at 41,620. It explained further that it "believes the current state of knowledge does not support reliable predictions of entrainment survival that would provide a defensible estimate for entrainment survival above zero at a national level." *Id.* It also stated that the performance standard would likely have been higher had it incorporated entrainment survival into its **[71]** conclusions. *Id.* While impingement mortality can be readily quantified, the EPA contends, entrainment mortality cannot because many entrained organisms are small, fragile, and prone to disintegrate during entrainment. The EPA also contends that death from entrainment sometimes occurs immediately but other times only after an organism is discharged back into the waterbody. In view of these factors, the EPA claims that it reasonably concluded that the available data did not support an estimate of entrainment survival at the national level.

None of the peer reviewers accepted the EPA's assumption of zero percent survival. For instance, peer reviewer Dr. Mark Bain was "not convinced by the arguments presented that fish do not survive entrainment in significant numbers" and concluded that there is "very strong evidence that entrainment survival is not zero." Another peer reviewer, Dr. Charles Hocutt, concluded that the EPA's assumption is based on inference and innuendo and does not statistically refute opposing views. Although peer reviewer Dr. Greg Garman stated that the study submitted by the power industry was "very clearly biased" and "too seriously flawed to provide a serious challenge to the EPA position," he also noted that "EPA's position is only slightly more defensible" given the lack of rigorous statistical analyses.

No peer reviewer, however, expressed the belief that reliable national statistics on entrainment survival exist. Hocutt found "it difficult for the layman and professional alike to draw confident conclusions without a detailed analysis" of the evidence, and Garman suspected a lack of sufficient data "to conduct a definitive and statistically valid test of the EPA zero survival assumption." While these comments do not, on balance, support the EPA's assumption, neither do they reflect any meaningful agreement on the incidence of entrainment survival.

Given the statutory directive to set national standards and the well-documented **[72]** uncertainty in the entrainment data, the EPA was well within its authority to determine that it could not provide a reasonable estimate of entrainment survival on a national basis. Judicial review is considerably

deferential when "the agency's decision rests on an evaluation of complex scientific data within the agency's technical **[*127]** expertise." *Texas Oil & Gas Ass'n*, 161 F.3d at 934; *City of Waukesha v. EPA*, 320 F.3d 228, 247 (D.C. Cir. 2003) (stating that an agency is entitled to "an extreme degree of deference . . . when it is evaluating scientific data within its technical expertise" (citation and internal quotation marks omitted)). Moreover, "it is within EPA's discretion to decide that in the wake of uncertainty, it would be better to give the values a conservative bent rather than err on the other side." *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 993 (D.C. Cir. 1997). Indeed, one peer reviewer expressly noted that the EPA had adopted a "conservative approach" by its assumption of zero entrainment survival in the Rule. It is thus clear that the EPA acted well within its discretion in presuming zero entrainment survival after the Agency had reviewed a substantial body of complex scientific data, and acknowledging that the evidence is inconclusive, it adopted a conservative approach.

For these reasons and those stated in *Riverkeeper I*, we therefore "defer to the EPA's judgment of how best to define and minimize 'adverse environmental impact.' "358 F.3d at 197.

D. *Nuclear Plants*

Entergy contends that the Phase II Rule fails to account for its purportedly disproportionate impacts on nuclear power plants and is therefore arbitrary and capricious. Entergy argues that nuclear facilities face unique safety concerns associated with the stable flow of cooling water to ensure safe reactor

operation and shutdown. Any change in water intake or **[73]** obstruction of water intake systems due to, for example, the clogging of screens, it argues further, affects nuclear power facilities in specific and serious ways. Entergy takes the position that the EPA failed to account for these issues in the Phase II Rule. We disagree because the record demonstrates adequate consideration by the EPA of nuclear plants' particular concerns.

The EPA considered and responded to comments from nuclear facilities during the rulemaking process. Most importantly, the Agency considered whether the Rule's requirements presented any concerns relating to the safety of nuclear facilities. 69 Fed. Reg. at 41,585 (noting that the EPA had coordinated with the Nuclear Regulatory Commission to ensure that there would not be a conflict between the EPA Rule and safety requirements applicable to nuclear facilities). The EPA ultimately included in the Phase II Rule a provision that accounts for this concern by providing for a site-specific compliance alternative for nuclear facilities. This provision states that if a nuclear facility "demonstrate[s] to the [EPA] based on consultation with the Nuclear Regulatory Commission that compliance with this subpart would result in a conflict with a safety requirement established by the Commission, the [EPA] must make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict." 40 C.F.R. § 125.94(f).

We defer to the EPA's determination that this compliance alternative ensures that any safety

concerns unique to nuclear facilities will prevail over application of the general Phase II requirements. *See Nat'l Wildlife Fed'n*, 286 F.3d at 570 (noting that appellate courts give an agency considerable discretion when it has weighed and balanced the appropriate factors); *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 802 (6th Cir. 1995) ("The overriding principle in our review of the Final Rule is that the agency has broad discretion to weigh all relevant factors **[74]** during rulemaking. The CWA does not state what weight **[*128]** should be accorded to the relevant factors; rather, the Act gives EPA the discretion to make those determinations."). Moreover, we are persuaded that the generous cost-cost compliance alternative, which we remand for lack of notice but do not address on the merits, may further account for Entergy's concerns.

Accordingly, we deny the petition for review insofar as it challenges the Rule's application to nuclear facilities.

E. *Independent Suppliers*

The Phase II Rule provides that a large, existing facility is subject to the Rule's requirements even when it obtains cooling water from an independent supplier that is not itself a Phase II existing facility. 40 C.F.R. § 125.91(c). Put differently, a Phase II facility can purchase cooling water only from suppliers whose intake structures are in compliance with the Phase II Rule. The provision is intended to prevent circumvention of the Rule by purchasing cooling water from non-Phase II entities. UWAG argues that the EPA gave inadequate notice of the scope of this so-called third-party or independent-supplier Rule. We agree.

UWAG contends that while the Phase I Rule included an independent-supplier provision similar to the one at issue here, the parallel provision of the Phase I Rule applies only to third-party suppliers that are not point sources, and thus do not need discharge permits and are not subject to any rule promulgated pursuant to section 316(b).[38] UWAG argues that the Rule's **[75]** proposal indicated that the Phase II provision would track the language of the Phase I provision. UWAG contends, therefore, that the EPA gave inadequate notice of the more broadly phrased provision that was actually promulgated: a rule applying both to the intake structures of third-parties that are not point sources, and therefore not subject to direct regulation under section 316(b), as well as to facilities with intake structures that will be governed by the Phase III rule, which will encompass smaller power plants and other facilities. The issue is thus whether the EPA provided adequate notice that the Rule ultimately promulgated would impose Phase II requirements on Phase III facilities that supply cooling- water to Phase II facilities.

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[38] The Phase I Rule provided that

> [u]se of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with an independent supplier (or multiple suppliers) of cooling water if the supplier or suppliers withdraw(s) water from waters of the United States . . . . [t]his provision is intended to prevent circumvention of these requirements by creating arrangements to receive cooling water from an entity that is not itself a point source.

40 C.F.R. § 125.81(b).

As we have noted, our inquiry into whether an agency has provided adequate notice of its rulemaking as required by the APA is guided by the "logical outgrowth" test. *Nat'l Black Media Coalition*, 791 F.2d at 1022. That is, we must determine whether the Agency's notice fairly apprised interested parties of the rulemaking, *id.*, or whether the final Rule was sufficiently remote or distant from the Agency's proposal to constitute a "surprise switcheroo," *Envtl. Integrity Project*, 425 F.3d at 996.

The proposed Rule published in the Federal Register stated that "[u]se of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with an independent supplier (or multiple suppliers) of cooling water if the supplier or suppliers withdraw(s) water from waters of the United States." 67 Fed. Reg. at 17,220. The notice then stated that the provision was **[*129]** intended "to prevent circumvention of these **[76]** requirements by creating arrangements to receive cooling water from *an entity that is not itself a point source*," *id.*(emphasis added), indicating that the provision would track the Phase I Rule's language. The initial language of the provision appearing in the proposal—defining "independent supplier" as any provider that withdraws water from waters of the United States—is virtually identical to the language in the final Rule.[39] The final Rule, however, states

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[39] The final Rule provides that "[u]se of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with one or more independent suppliers of cooling water if the supplier withdraws water from waters of the United States but is not itself a Phase II existing

that it "is intended to prevent circumvention of these requirements by creating arrangements to receive cooling water from *an entity that is not itself a Phase II existing facility*." 40 C.F.R. § 125.91(c) (emphasis added). This difference, while small, is not insignificant. As noted, under the proposed Rule, Phase II facilities could purchase cooling water from facilities complying with the Phase I, II, or III requirements. Under the final Rule, by contrast, Phase II facilities can purchase cooling water only from facilities complying with the Phase II Rule. The proposal therefore apprised affected parties of the general subject, but not the scope, of the Rule ultimately promulgated.

Interested parties were thus given notice that the EPA sought to prevent circumvention of its rules and an opportunity to comment on this general policy, but could not have anticipated the final Rule's scope. Indeed, while the final provision has roots in the proposal, it clearly reaches further than the proposed provision and even the more stringent Phase I Rule. Affected parties would therefore have had no reason to anticipate the Agency's final **[77]** course in light of the initial notice. Because the EPA provided inadequate notice of the scope of the Phase II Rule's independent-supplier provision, we conclude that the Rule ultimately promulgated is not a "logical outgrowth" of the proposed Rule. *Nat'l Black Media Coalition*, 791 F.2d at 1022.

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facility . . . . This provision is intended to prevent circumvention of the requirements by creating arrangements to receive cooling water from an entity that is not itself a Phase II existing facility." 40 C.F.R. § 125.91(c).

Our conclusion rests in large part on the similarity between the Phase I Rule's independent-supplier provision and the proposed Phase II Rule's parallel provision. Given that the requirements under the Phase I Rule are more stringent than those imposed under the Phase II Rule, the proposal provided no notice that the Phase II Rule's independent-supplier provision would be *more* stringent than the Phase I Rule's provision. We therefore remand this aspect of the Rule.

F. *Definition of "Great Lakes"*

The entrainment performance standard of 40 C.F.R. § 125.94(b)(2) applies to facilities that use cooling water "withdrawn from . . . one of the Great Lakes." 40 C.F.R. § 125.49(b)(2)(ii)(A). "Great Lakes," however, is not defined in the Rule. An affidavit of UWAG's counsel states that UWAG members

> have been told by state regulators that they have been told by EPA Headquarters that EPA would apply the Great Lakes national performance standards regarding impingement and entrainment to the cooling water intake structures located in the Great Lakes connecting channels or in waterways with open fish passage to a Great Lake and within 30 miles from a Great Lake.

[*130] UWAG argues that interested parties were given no notice of this interpretation of the Phase II Rule or opportunity to comment on it and that the interpretation has no record support. UWAG also remarks that the EPA mentioned in the preamble to the Rule that in assessing the national **[78]**

environmental benefits of its final Phase II Rule, it had evaluated the benefits in seven study regions. The EPA defined the Great Lakes *region* for that purpose as follows:

> The Great Lakes region includes all facilities in scope of the Phase II rule that withdraw water from Lakes Ontario, Erie, Michigan, Huron, and Superior or are located on a waterway with open fish passage to a Great Lake and within 30 miles of the lake.

69 Fed. Reg. at 41,655. UWAG contends that the EPA never indicated that this definition would apply to § 125.94(b)(2) and seeks either a ruling that "Great Lakes" has its ordinary meaning or a remand for an express definition of what the term means.

Notwithstanding UWAG's proffer that the EPA has informally interpreted "Great Lakes," the Rule itself does not define what is encompassed by the term, and UWAG has provided no documentary evidence that the EPA has issued a formal and binding definition or even applied a particular definition in a permitting proceeding. There is, therefore, no final agency action for us to review. We agree with the holding of the Seventh Circuit in *American Paper Institute, Inc. v. Environmental Protection Agency*, that in the absence of a formal and binding rule or some other final agency action, judicial review is not available at this time. 882 F.2d 287, 289 (7th Cir. 1989). We therefore dismiss for lack of jurisdiction so much of the petition for review as challenges the purported definition of "Great Lakes."

G. *Preemptive Preservation of Issues*

UWAG has purported to "preserve" the right to raise new challenges to the Phase II Rule if we remand significant aspects of it to the EPA because UWAG views the Rule as an integrated whole. If certain aspects of the Rule are remanded, UWAG suggests, previously unobjectionable provisions may become, in its view, unacceptable. We are not sure what **[79]** challenges UWAG seeks to preserve. Of course, UWAG will have the right to challenge any rule the EPA may promulgate on remand through a new petition for review. *See*33 U.S.C. § 1369(b). Insofar as UWAG seeks to raise further challenges following the issuance of our ruling but before the EPA acts on remand, however, it waived those challenges by failing to raise them in the briefs it has already submitted to this Court. *See Norton v. Sam's Club*, 145 F.3d 114, 117 (2d Cir. 1998) (noting that issues not argued in a party's briefs are considered waived). We thus reject UWAG's claim to have preserved the right to raise new challenges to the Rule currently before us on this petition for review.

CONCLUSION

For the foregoing reasons, the state and environmental petitioners' petitions are granted in part and denied in part, and the industry petitioners' petitions granted in part, denied in part, and dismissed in part for lack of jurisdiction. We remand to the EPA the provision establishing BTA so that it may provide either a reasoned explanation of its decision or a new determination of BTA based on permissible considerations. We **[80]** further remand the site-specific cost-cost variance and the TIOP provision because the cost-cost variance and subpart

(d)(2) of the TIOP provision provided inadequate notice and both depend **[*131]** on the BTA determination, which we remand today.

We remand as based on impermissible constructions of the statute those provisions that (1) set performance standards as ranges without requiring facilities to achieve the greatest reduction of adverse impacts they can; (2) allow compliance through restoration measures; and (3) authorize a site-specific cost-benefit variance as impermissible under the statute. We further remand for notice and comment the independent suppliers provision. We also direct the EPA on remand to adhere to the definition of "new facility" set forth in the Phase I Rule or to amend that definition by rulemaking subject to notice and comment. Finally, we dismiss for lack of jurisdiction so much of the petitions as challenges the purported definition of "Great Lakes" and deny as moot the motions to strike certain material from the record and to supplement the record with other material.

APPENDIX B

COURT OF APPEALS ORDER DENYING PETITIONS FOR REHEARING

UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT
THURGOOD MARSHALL U.S. COURTHOUSE
40 FOLEY SQUARE
NEW YORK 10007

Catherine O'Hagan Wolfe
CLERK

Date: [File-stamped: July 5, 2007]
Docket **04-6692-ag**
Short Title: Riverkeeper, Inc. v. EPA
Agency Number ow-02-0049
Agency: Environmental Protection Agency

At a stated term of the United States Court of Appeals for the Second Circuit, held at the Daniel Patrick Moynihan United Stats Courthouse, 500 Pearl Street, in the City of New York, on this 5th day of July two thousand seven.

Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save The Bay-People For Narragansett Bay, Friends Of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, Surfrider Foundation, State Of Rhode Island, State Of Connecticut, State Of Delaware, Commonwealth Of Massachusetts, State Of New Jersey, State Of New York, Appala-

chian Power Company, Illinois Energy Association, Utility Water Act Group, PSEG Fossil LLC, PSEG Nuclear LLC, Entergy Corporation,

Petitioners.

v.

United States Environmental Protection Agency, Stephen L. Johnson, in his official capacity as Administrator of the United States Environmental Protection Agency,

Respondents.

A petition for panel rehearing and a petition for rehearing en banc having been filed herein by the petitioners Entergy Corp. Utility Water Act Group, PSEG Fossil LLC, and PSEG Nuclear LLC. Upon consideration by the panel that decided the appeal, it is ORDERED that said petition for rehearing is **DENIED**.

It is further noted that the petition for rehearing en banc has been transmitted to the judges for the court in regular active service and to any other judge that heard the appeal and that no such judge has requested that a vote be taken thereon.

For the Court,

Catherine O'Hagan Wolfe, Clerk

By: [signature illegible]

Motion Staff Attorney

APPENDIX C

RELEVANT STATUTORY PROVISIONS

Sections 301, 304, 306, 316, 401 and 402 of the Federal Water Pollution Control Act (the Clean Water Act), as added by Pub. L. No. 92-500, § 2, 86 Stat. 844, 850, 854, 876, & 880 (Oct. 18, 1972), as amended, 33 U.S.C. §§ 1311, 1314, 1316, 1326, 1341 & 1342 (excerpts)

TITLE III—STANDARDS AND ENFORCEMENT

EFFLUENT LIMITATIONS

SEC. 301 [33 U.S.C. § 1311]. (a) Except as in compliance with this section and sections 302, 306, 307, 318, 402, and 404 of this Act, the discharge of any pollutant by any person shall be unlawful.

(b) In order to carry out the objective of this Act there shall be achieved--

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 304(b) of this Act, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 307 of this Act; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 203 of this Act prior to June 30, 1974 (for

which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 304(d)(1) of this Act; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedule of compliance, established pursuant to any State law or regulations, (under authority preserved by section 510) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this Act.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 304(b)(2) of this Act, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 315), that such elimination is technologically and economically achievable for category or class of point sources as determined in accordance with regulations

issued by the Administrator pursuant to section 304(b)(2) of this Act, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under section 307 of this Act;

[(B): subparagraph (B) repealed by Pub. L. 97-117, § 21(b), 95 Stat. 1632 (Dec. 29, 1981)]

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95–30 of the Committee on Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 304(b), and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 307 of this Act which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitation in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 304(b), and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section

304(b), and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to section 304(a)(4) of this Act shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the Administrator pursuant to section 304(b)(4) of this Act; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 304(b), and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of section 402(a)(1) in a permit issued after enactment of the Water Quality Act of 1987,

compliance as expeditiously as practicable but in no case later than three years after the date such limitations are established, and in no case later than March 31, 1989.

(c) The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

* * * *

INFORMATION AND GUIDELINES

SEC. 304 [33 U.S.C. § 1314]. (a)(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after the date of enactment of this title (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of

pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after the date of enactment of this title (and from time to time thereafter revise) information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all navigable waters, ground waters, waters of the contiguous zone, and the oceans; (B) on the factors necessary for the protection and propagation of shellfish, fish, and wildlife for classes and categories of receiving waters and to allow recreational activities in and on the water; and (C) on the measurement and classification of water quality; and (D) for the purpose of section 303, on and the identification of pollutants suitable for maximum daily load measurement correlated with the achievement of water quality objectives.

(3) Such criteria and information and revisions thereof shall be issued to the States and shall be published in the Federal Register and otherwise made available to the public.

(4) The Administrator shall, within 90 days after the date of enactment of the Clean Water Act of 1977 and from time to time thereafter, publish and revise as appropriate information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH. The

thermal component of any discharge shall not be identified as a conventional pollutant under this paragraph.

(5)(A) The Administrator, to the extent practicable before consideration of any request under section 301(g) of this Act and within six months after the date of enactment of the Clean Water Act of 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(B) The Administrator, to the extent practicable before consideration of any application under section 301(h) of this Act and within six months after the date of enactment of Clean Water Act of 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(6) The Administrator shall, within three months after enactment of the Clean Water Act of 1977 and annually thereafter, for purposes of section 301(h) of this Act publish and revise as appropriate information identifying each water quality standard in effect under this Act of State law, the specific pollutants associated with such water quality standard, and the particular waters to which such water quality standard applies.

(7) GUIDANCE TO STATES.—The Administrator, after consultation with appropriate State agencies and on the basis of criteria and information published under paragraphs (1) and (2) of this subsection, shall develop and publish, within 9 months after the date of the enactment of the Water Quality Act of 1987, guidance to the States on performing the identification required by section 304(l)(1) of this Act.

(8) INFORMATION ON WATER QUALITY CRITERIA.—The Administrator, after consultation with appropriate State agencies and within 2 years after the date of the enactment of the Water Quality Act of 1987, shall develop and publish information on methods for establishing and measuring water quality criteria for toxic pollutants on other bases than pollutant-by-pollutant criteria, including biological monitoring and assessment methods.

(9) REVISED CRITERIA FOR COASTAL RECREATION WATERS.—

(A) IN GENERAL.—Not later than 5 years after the date of the enactment of this paragraph, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 104(v), for the purpose of protecting human health in coastal recreation waters.

(B) REVIEWS.—Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter, the Administrator shall review and, as necessary, revise the water quality criteria.

(b) For the purposes of adopting or revising effluent limitations under this Act the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of enactment of this title, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. Such regulations shall—

(1)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best practicable control technology currently available for classes and categories to point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the control measures and practices to be applicable to point sources (other than publicly owned treatment works) within such categories of classes. Factors relating to the assessment of best practical control technology currently available to comply with subsection (b)(1) of section 301 of this Act shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also

take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(2)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best measures and practices available to comply with subsection (b)(2) of section 301 of this Act to be applicable to any point source (other than publicly owned treatment works) within such categories of classes. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(3) identify control measures and practices available to eliminate the discharge of pollutants from categories and classes of point sources, taking into account the cost of achieving such elimination of the discharge of pollutants; and

(4)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best conventional pollutant control technology (including measures and practices) for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best conventional pollutant control technology measures and practices to comply with section 301(b)(2)(E) of this Act to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best conventional pollutant control technology (including measures and practices) shall include consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, and shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques,

process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.

* * * *

NATIONAL STANDARDS OF PERFORMANCE

SEC. 306 [33 U.S.C. § 1316]. (a) For purposes of this section:

(1) The term "standard of performance" means a standard for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

(2) The term "new source" means any source, the construction of which is commenced after the publication of proposed regulations prescribing a standard of performance under this section which will be applicable to such sources, if such standard is thereafter promulgated in accordance with this section.

(3) The term "source" means any building, structure, facility, or installation from which there is or may be the discharge of pollutants.

(4) The term "owner or operator" means any person who owns, leases, operates, controls, or supervises a source.

(5) The term "construction" means any placement, assembly, or installation of facilities or

equipment (including contractual obligations to purchase such facilities or equipment) at the premises where such equipment will be used, including preparation work at such premises.

(b)(1)(A) The Administrator shall, within ninety days after the date of enactment of this title publish (and from time to time thereafter shall revise) a list of categories of sources, which shall, at the minimum, include:

pulp and paper mills;

paperboard, builders paper and board mills;

meat product and rendering processing;

dairy product processing; grain mills;

canned and preserved fruits and vegetables processing;

canned and preserved seafood processing;

sugar processing;

textile mills;

cement manufacturing;

feedlots;

electroplating;

organic chemicals manufacturing;

inorganic chemicals manufacturing;

plastic and synthetic materials manufacturing;

soap and detergent manufacturing

fertilizer manufacturing;

petroleum refining;

iron and steel manufacturing;

nonferrous metals manufacturing;

phosphate manufacturing;

steam electric powerplants;

ferroalloy manufacturing;

leather tanning and finishing;

glass and asbestos manufacturing;

rubber processing; and

timber products processing.

(B) As soon as practicable, but in no case more than one year, after a category of sources is included in a list under subparagraph (A) of this paragraph, the Administrator shall propose and publish regulations establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one hundred and twenty days after publication of such proposed regulations, such standards with such adjustments as he deems appropriate. The Administrator shall, from time to time, as technology and alternatives change, revise such standards following the procedure required by this subsection for promulgation of such standards. Standards of performance, or revisions thereof, shall become effective upon promulgation. In establishing or revising Federal standards of performance for new sources under this section, the Administrator shall take into

consideration the cost of achieving such effluent reduction, and any non-water quality environmental impact and energy requirements.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards and shall consider the type of process employed (including whether batch or continuous).

(3) The provisions of this section shall apply to any new source owned or operated by the United States.

(c) Each State may develop and submit to the Administrator a procedure under State law for applying and enforcing standards of performance for new sources located in such State. If the Administrator finds that the procedure and the law of any State require the application and enforcement of standards of performance to at least the same extent as required by this section, such State is authorized to apply and enforce such standards of performance (except with respect to new sources owned or operated by the United States).

(d) Notwithstanding any other provision of this Act, any point source the construction of which is commenced after the date of enactment of the Federal Water Pollution Control Act Amendments of 1972 and which is so constructed as to meet all applicable standards of performance shall not be subject to any more stringent standard of performance during a ten-year period beginning on the date of completion of such construction or during the period of depreciation or amortization of such facility for the purposes of section 167 or 169 (or

both) of the Internal Revenue Code of 1954, whichever period ends first.

(e) After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

* * * *

THERMAL DISCHARGES

SEC. 316 [33 U.S.C. § 1326]. (a) With respect to any point source otherwise subject to the provisions of section 301 or section 306 of this Act, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such sections for such plant, with respect to the thermal component of such discharge (taking into account the interaction of such thermal component with other pollutants), that will assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.

(b) Any standard established pursuant to section 301 or section 306 of this Act and applicable to a

point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

(c) Notwithstanding any other provision of this Act, any point source of a discharge having a thermal component, the modification of which point source is commenced after the date of enactment of the Federal Water Pollution Control Act Amendments of 1972 and which, as modified, meets effluent limitations established under section 301 or, if more stringent, effluent limitations established under section 303 and which effluent limitations will assure protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in or on the water into which the discharge is made, shall not be subject to any more stringent effluent limitation with respect to the thermal component of its discharge during a ten year period beginning on the date of completion of such modification or during the period of depreciation or amortization of such facility for the purpose of section 167 or 169 (or both) of the Internal Revenue Code of 1954, whichever period ends first.

* * * *

TITLE IV—PERMITS AND LICENSES

CERTIFICATION

SEC. **401 [(33 U.S.C. 1341]**. (a)(1) Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge origi-

nates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this Act. In the case of any such activity for which there is not an applicable effluent limitation or other limitation under sections 301(b) and 302, and there is not an applicable standard under sections 306 and 307, the State shall so certify, except that any such certification shall not be deemed to satisfy section 511(c) of this Act. Such State or interstate agency shall establish procedures for public notice in the case of all applications for certification by it and, to the extent it deems appropriate, procedures for public hearings in connection with specific applications. In any case where a State or interstate agency has no authority to give such a certification, such certification shall be from the Administrator. If the State, interstate agency, or Administrator, as the case may be, fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request, the certification requirements of this subsection shall be waived with respect to such Federal application. No license or permit shall be granted until the certification required by this section has been obtained or has been waived as provided in the preceding sentence. No license or permit shall be granted if certification has been denied by the State, interstate agency, or the Administrator, as the case may be.

(2) Upon receipt of such application and certification the licensing or permitting agency shall immediately notify the Administrator of such application and certification. Whenever such a discharge may affect, as determined by the Administrator, the quality of the waters of any other State, the Administrator within thirty days of the date of notice of application for such Federal license or permit shall so notify such other State, the licensing or permitting agency, and the applicant. If, within sixty days after receipt of such notification, such other State determines that such discharge will affect the quality of its waters so as to violate any water quality requirement in such State, and within such sixty-day period notifies the Administrator and the licensing or permitting agency in writing of its objection to the issuance of such license or permit and requests a public hearing on such objection, the licensing or permitting agency shall hold such a hearing. The Administrator shall at such hearing submit his evaluation and recommendations with respect to any such objection to the licensing or permitting agency. Such agency, based upon the recommendations of such State, the Administrator, and upon any additional evidence, if any, presented to the agency at the hearing, shall condition such license or permit in such manner as may be necessary to insure compliance with applicable water quality requirements. If the imposition of conditions cannot insure such compliance such agency shall not issue such license or permit.

(3) The certification obtained pursuant to paragraph (1) of this subsection with respect to the construction of any facility shall fulfill the requirements of this subsection with respect to certifica-

tion in connection with any other Federal license or permit required for the operation of such facility unless, after notice to the certifying State, agency, or Administrator, as the case may be, which shall be given by the Federal agency to whom application is made for such operating license or permit, the State, or if appropriate, the interstate agency or the Administrator, notifies such agency within sixty days after receipt of such notice that there is no longer reasonable assurance that there will be compliance with the applicable provisions of sections 301, 302, 303, 306, and 307 of this Act because of changes since the construction license or permit certification was issued in (A) the construction or operation of the facility, (B) the characteristics of the waters into which such discharge is made, (C) the water quality criteria applicable to such waters or (D) applicable effluent limitations or other requirements. This paragraph shall be inapplicable in any case where the applicant for such operating license or permit has failed to provide the certifying State, or, if appropriate, the interstate agency or the Administrator, with notice of any proposed changes in the construction or operation of the facility with respect to which a construction license or permit has been granted, which changes may result in violation of section 301, 302, 303, 306, or 307 of this Act.

(4) Prior to the initial operation of any federally licensed or permitted facility or activity which may result in any discharge into the navigable waters and with respect to which a certification has been obtained pursuant to paragraph (1) of this subsection, which facility or activity is not subject to a Federal operating license or permit, the licensee or

permittee shall provide an opportunity for such certifying State, or, if appropriate, the interstate agency or the Administrator to review the manner in which the facility or activity shall be operated or conducted for the purposes of assuring that applicable effluent limitations or other limitations or other applicable water quality requirements will not be violated. Upon notification by the certifying State, or if appropriate, the interstate agency or the Administrator that the operation of any such federally licensed or permitted facility or activity will violate applicable effluent limitations or other limitations or other water quality requirements such Federal agency may, after public hearing, suspend such license or permit. If such license or permit is suspended, it shall remain suspended until notification is received from the certifying State, agency, or Administrator, as the case may be, that there is reasonable assurance that such facility or activity will not violate the applicable provisions of section 301, 302, 303, 306, or 307 of this Act.

(5) Any Federal license or permit with respect to which a certification has been obtained under paragraph (1) of this subsection may be suspended or revoked by the Federal agency issuing such license or permit upon the entering of a judgment under this Act that such facility or activity has been operated in violation of the applicable provisions of section 301, 302, 303, 306, or 307 of this Act.

(6) Except with respect to a permit issued under section 402 of this Act, in any case where actual construction of a facility has been lawfully commenced prior to April 3, 1970, no certification shall

be required under this subsection for a license or permit issued after April 3, 1970, to operate such facility, except that any such license or permit issued without certification shall terminate April 3, 1973, unless prior to such termination date the person having such license or permit submits to the Federal agency which reissued such license or permit a certification and otherwise meets the requirements of this section. (b) Nothing in this section shall be construed to limit the authority of any department or agency pursuant to any other provision of law to require compliance with any applicable water quality requirements. The Administrator shall, upon the request of any Federal department or agency, or State or interstate agency, or applicant, provide, for the purpose of this section, any relevant information on applicable effluent limitations, or other limitations, standards, regulations, or requirements, or water quality criteria, and shall, when requested by any such department or agency or State or interstate agency, or applicant, comment on any methods to comply with such limitations, standards, regulations, requirements, or criteria.

(c) In order to implement the provisions of this section, the Secretary of the Army, acting through the Chief of Engineers, is authorized, if he deems it to be in the public interest, to permit the use of spoil disposal areas under his jurisdiction by Federal licenses or permittees, and to make an appropriate charge for such use. Moneys received from such licensees or permittees shall be deposited in the Treasury as miscellaneous receipts.

(d) Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations, under section 301 or 302 of this Act, standard of performance under section 306 of this Act, or prohibition, effluent standard, or pretreatment standard under section 307 of this Act, and with any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

SEC. 402 [33 U.S.C. § 1342]. (a)(1) Except as provided in sections 318 and 404 of this Act, the Administrator may, after opportunity for public hearing, issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 301(a), upon condition that such discharge will meet either (A) all applicable requirements under sections 301, 302, 306, 307, 308, and 403 of this Act, or (B) prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this Act.

(2) The Administrator shall prescribe conditions for such permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate.

(3) The permit program of the Administrator under paragraph (1) of this subsection, and permits issued thereunder, shall be subject to the same terms, conditions, and requirements as apply to a State permit program and permits issued thereunder under subsection (b) of this section.

(4) All permits for discharges into the navigable waters issued pursuant to section 13 of the Act of March 3, 1899, shall be deemed to be permits issued under this title, and permits issued under this title shall be deemed to be permits issued under section 13 of the Act of March 3, 1899, and shall continue in force and effect for their term unless revoked, modified, or suspended in accordance with the provisions of this Act.

(5) No permit for a discharge into the navigable waters shall be issued under section 13 of the Act of March 3, 1899, after the date of enactment of this title. Each application for a permit under section 13 of the Act of March 3, 1899, pending on the date of enactment of this Act shall be deemed to be an application for a permit under this section. The Administrator shall authorize a State, which he determines has the capability of administering a permit program which will carry out the objective of this Act, to issue permits for discharges into the navigable waters within the jurisdiction of such State. The Administrator may exercise the authority granted him by the preceding sentence only during the period which begins on the date of enactment of this Act and ends either on the ninetieth day after the date of the first promulgation of guidelines required by section 304(h)(2) of this Act, or the date of approval by the

Administrator of a permit program for such State under subsection (b) of this section, whichever date first occurs, and no such authorization to a State shall extend beyond the last day of such period. Each such permit shall be subject to such conditions as the Administrator determines are necessary to carry out the provisions of this Act. No such permit shall issue if the Administrator objects to such issuance.

* * * *

APPENDIX D

EPA FINAL RULE

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122, 123, 124, and 125

[FRL-7625-9]

RIN 2040-AD62

National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities

Friday, July 9, 2004

[*41576]* AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today's final rule implements section 316(b) of the Clean Water Act (CWA) for certain existing power producing facilities that employ a cooling water intake structure and are designed to withdraw 50 million gallons per day (MGD) or more of water from rivers, streams, lakes, reservoirs, estuaries, oceans, or other waters of the United States for cooling purposes. This final rule constitutes Phase II of EPA's section 316(b) regulation development and establishes national requirements, and procedures for implementing those requirements, applicable to the location, design, construction, and capacity of cooling water

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* Numbers of the form [*41576] are citations to 69 Fed. Reg., No. 131 (July 9, 2004).

intake structures at these facilities. The rule applies to existing facilities that, as their primary activity, both generate and transmit electric power or generate electric power but sell it to another entity for transmission. The national requirements, which will be implemented through National Pollutant Discharge Elimination System (NPDES) permits, are based on the best technology available to minimize the adverse environmental impact associated with the use of cooling water intake structures.

Today's final rule establishes performance standards that are projected to reduce impingement mortality by 80 to 95 percent and, if applicable, entrainment by 60 to 90 percent. With the implementation of today's final rule, EPA intends to minimize the adverse environmental impact of cooling water intake structures by reducing the number of aquatic organisms lost as a result of water withdrawals associated with these structures.

DATES: This regulation is effective September 7, 2004. For judicial review purposes, this final rule is promulgated as of 1 p.m. Eastern Standard Time (EST) on July 23, 2004, as provided in .

ADDRESSES: The docket for today's final rule is available for public inspection at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: For additional technical information contact Martha Segall at (202) 566-1041 or Debra Hart at (202) 566-6379. The e-mail address for the above contacts is rule.316b@epa.gov.

SUPPLEMENTARY INFORMATION:

I. General Information

A. What Entities Are Regulated by This Action?

This final rule applies to Phase II existing facilities that are point sources; as their primary activity both generate and transmit electric power or generate electric power for sale to another entity for transmission; use or propose to use one or more cooling water intake structures with a total design intake flow of 50 million gallons per day (MGD) or more to withdraw water from waters of the United States; and use 25 percent of water withdrawn exclusively for cooling water purposes. This rule defines "existing facility" as any facility that commenced constructions on or before January 17, 2002, and any modification of, or any addition of a unit at such a facility that does not meet the definition of a new facility at § 125.83.

This rule defines the term "cooling water intake structure" to mean the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the United States. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps.

Category*	Examples of regulated entities
Federal, State, and Local Government	Steam electric generating point source dischargers that employ cooling water intake structures.
Industry	Steam electric generating industrial point source dischargers that employ cooling water intake structures (this includes utilities and nonutilities).

This exhibit is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This exhibit lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the exhibit could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria in of the rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. *How Can I Get Copies of This Document and Other Related Information?*

1. Docket

EPA has established an official public docket for this action under Docket ID No. OW 2002-0049. The official public docket consists of the documents

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* Columns 3 and 4 of this table, showing Standard Industrial Classification (SIC) codes and North American Industry Classification System (NAICS) codes, have been omitted.

specifically referenced in this action, any public comments received, and other information related to this action. Although a part of the official docket, the public docket does not include information claimed as Confidential Business Information (CBI) or other information the disclosure of which is restricted by statute. The official public docket is the collection of materials that is available for public viewing at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Water Docket is (202) 566-2426. To view docket materials, **[*41577]** please call ahead to schedule an appointment. Every user is entitled to copy 266 pages per day before incurring a charge. The Docket may charge 15 cents for each page over the 266-page limit plus an administrative fee of $25.00.

2. Electronic Access

You may access this **Federal Register** document electronically through the EPA Internet under the "**Federal Register**" listings at *http://www.epa.gov/fedrgstr/*.

An electronic version of the public docket is available through EPA's electronic public docket and comment system, EPA Dockets. You may use EPA Dockets at *http://www.epa.gov/edocket/* to view public comments, access the index listing of the contents of the official public docket, and to access those documents in the public docket that are available electronically. Although not all docket

materials may be available electronically, you may still access any of the publicly available docket materials through the docket facility identified in section I.B.1. Once in the system, select "search," then key in the appropriate docket identification number.

C. *Supporting Documentation*

The final regulation is supported by three major documents:

1. Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-04-005), hereafter referred to as the Economic and Benefits Analysis. This document presents the analysis of compliance costs, closures, energy supply effects, and benefits associated with the final rule.

2. Regional Analysis for the Final Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-04-006), hereafter referred to as the Regional Analysis Document or the Regional Study(ies) Document. This document examines cooling water intake structure impacts and regulatory benefits at the regional level.

3. Technical Development Document for the Final Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-04-007), hereafter referred to as the Technical Development Document. This document presents detailed information on the methods used to develop unit costs and describes the set of technologies that may be used to meet the final rule's requirements.

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II. Scope and Applicability of the Final Rule

This rule applies to owners and operators of existing facilities, as defined in § 125.93 of today's rule that meet all of the following criteria:

- The facility's primary activity is to generate electric power. The facility either transmits the electric power itself, or sells the electric power to another entity for transmission;

- The facility is a point source that uses or proposes to use one or more cooling water intake structures, including a cooling water intake structure operated by an independent supplier that withdraws water from waters of the United States and provides cooling water to the facility by any sort of contract or other arrangement;

- The cooling water intake structure(s) withdraw(s) cooling water from waters of the United States and at least twenty-five (25) percent of the water withdrawn is used exclusively for cooling purposes measured on an average annual basis;

- The facility is a point source; and

- The cooling water intake structures have a total design intake flow of 50 **[*41578]** million gallons per day (MGD) or greater.

In the case of a Phase II existing facility that is co-located with a manufacturing facility, only that portion of the cooling water flow that is used by the

Phase II facility to generate electricity for sale to another entity will be considered when determining whether the 50 MGD and 25 percent criteria are met. Facilities subject to this final rule are referred to as "Phase II existing facilities." Existing facilities with design flows below the 50 MGD threshold, as well as most existing manufacturing facilities, offshore seafood processors, and offshore and coastal oil and gas extraction facilities are not subject to this rule. Those facilities have different characteristics as compared to the large, power-generating facilities subject to today's rule. If an existing facility is a point source and has or is required to have an NPDES permit, but does not meet the applicability thresholds in today's rule, it is subject to permit conditions implementing section 316(b) of the CWA set by the permit director on a case-by-case basis, using best professional judgment. EPA expects to address at least some of these facilities in a separate rulemaking, referred to as Phase III.

In the preamble to the proposed rule EPA indicated that its intent was to exclude from regulation under the Phase II rule existing facilities whose primary business is manufacturing. See , *e.g.*, 67 FR 17124 (April 9, 2002). At the same time, in § 125.91(a)(3) of the proposed rule, the applicability criteria covered facilities that both generate and transmit electric power, or generate electric power but sell it to another entity for transmission. Numerous commenters indicated concerns that, as proposed, § 125.91(a)(3) would not clearly exclude all existing manufacturing facilities from the Phase II rule since some facilities generate electric power primarily for their own use, but transmit or sell any surplus. Therefore, for the final rule, EPA revised

§ 125.91 so that it reaches only those existing facilities that generate and transmit or sell electric power as their primary activity. The final rule does not apply to existing manufacturing facilities, including manufacturing facilities that generate power for their own use and transmit any surplus power, or sell it for transmission, provided the primary activity of the facility is not electric power generation.

A. *What Is an "Existing Facility" for Purposes of the Section 316(b) Phase II Rule?*

In today's rule, EPA is defining the term "existing facility" to include any facility that commenced construction as described in 40 CFR 122.29(b)(4)[1] on or before January 17, 2002. EPA established January 17, 2002 as the date for distinguishing new facilities from existing ones because that is the effective date of the Phase I new facility rule. In addition, EPA is defining the term "existing facility" in this rule to include modifications and additions to such facilities, the construction of which commences after January 17, 2002, that do not meet the definition of a new facility at 40 CFR 125.83, the definition used to define the scope of the Phase I rule. That definition states:

> "New facility means any building, structure, facility, or installation that meets the definition of a 'new source' or 'new discharger' in [other

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[1] Construction is commenced if the owner or operator has undertaken certain installation and site preparation activities that are part of a continuous on-site construction program, and it includes entering into certain specified binding contractual obligations as one criterion (40 CFR 122.29(b)(4)).

NPDES regulations] and is a greenfield or stand-alone facility; commences construction after January 17, 2002; and uses either a newly constructed cooling water intake structure, or an existing cooling water intake structure whose design capacity is increased to accommodate the intake of additional cooling water. New facilities include only 'greenfield' and 'stand-alone' facilities. A greenfield facility is a facility that is constructed at a site at which no other source is located or that totally replaces the process or production equipment at an existing facility (see 40 CFR 122.29(b)(1)(i) and (ii). A stand-alone facility is a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site (see 40 CFR 122.29(b)(1)(iii). New facility does not include new units that are added to a facility for purposes of the same general industrial operation (for example, a new peaking unit at an electrical generating station)."[2]

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[2] The Phase I rule also listed examples of facilities that would be "new" facilities and facilities that would "not be considered a 'new facility' in two numbered paragraphs. These read as follows:

"(1) Examples of 'new facilities' include, but are not limited to: the following scenarios:

(i) A new facility is constructed on a site that has never been used for industrial or commercial activity. It has a new cooling water intake structure for its own use.

(ii) A facility is demolished and another facility is constructed in its place. The newly-constructed facility

The preamble to the final Phase I rule discusses this definition at 66 FR 65256; 65258–65259; 65285–65287, December 18, 2001.

EPA included in its Phase II proposed rule a freestanding definition of "existing facility." That definition read as follows:

> "Existing facility means any facility that commenced construction before January 17, 2002; and

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uses the original facility's cooling water intake structure, but modifies it to increase the design capacity to accommodate the intake of additional cooling water.

(iii) A facility is constructed on the same property as an existing facility, but is a separate and independent Industrial operation. The cooling water intake structure used by the original facility is modified by constructing a new intake bay for the use of the newly constructed facility or is otherwise modified to increase the intake capacity for the new facility.

(2) Examples of facilities that would not be considered a 'new facility' include, but are not limited to, the following scenarios:

(i) A facility in commercial or industrial operation is modified and either continues to use its original cooling water intake structure or uses a new or modified cooling water intake structure.

(ii) A facility has an existing intake structure. Another facility (a separate and independent industrial operation), is constructed on the same property and connects to the facility's cooling water intake structure behind the intake pumps, and the design capacity of the cooling water intake structure has not been increased. This facility would not be considered a 'new facility' even if routine maintenance or repairs that do not increase the design capacity were performed on the intake structure."

(1) Any modification of such a facility;

(2) Any addition of a unit at such a facility for purposes of the same industrial operation;

(3) Any addition of a unit at such a facility for purposes of a different industrial operation, if the additional unit uses an existing cooling water intake structure and the design capacity of the intake structure is not increased; or

(4) Any facility constructed in place of such a facility, if the newly constructed facility uses an existing cooling water intake structure whose design intake flow is not increased to accommodate the intake of additional cooling water." 67 FR 17221.

Upon further consideration, EPA has decided that it would be clearest to define existing facility primarily by stating that any facility that is not a new facility under 40 CFR 125.83 is an existing facility for purposes of this subpart. Accordingly, the language in this final rule is intended to be clear and consistent with EPA's definition of new facility in the Phase I rule at 40 CFR 125.83. In addition, the definition in today's regulation is also intended to ensure that sources excluded from the definition of new facility in the Phase I rule are captured by the definition of existing facility for the purposes of today's rule. At the same time, EPA believes that the approach taken in **[*41579]** today's rule is identical in terms of effect to the approach in the proposed rule. Thus, the approach taken in today's final rule is in no way intended to change the scope of the rule as compared with the proposal as far as the facilities treated as "existing" facilities under the

rule. The change is in drafting technique, not in meaning.

The facility encompassed by today's regulation is the point source that uses a cooling water intake structure to generate electric power. This is because the requirements of CWA section 316(b) are implemented through NPDES permits, which are issued only to point source dischargers of pollutants to waters of the United States. A point source generating electric power would be subject to Phase I or Phase II even if the cooling water intake structure it uses is located elsewhere. Similarly, modifications or additions to the cooling water intake structure (or even the total replacement of an existing cooling water intake structure with a new one) does not convert an otherwise unchanged existing facility into a new facility, regardless of the purpose of such changes (*e.g.*, to comply with today's rule or to increase capacity). Rather, the determination as to whether a facility is new or existing focuses on the power-generating point source itself, *i.e.*, whether it is a greenfield facility or a stand-alone facility. This focus on the point source discharger is consistent with section 316(b), which by its express terms applies only to point sources.

Under this rule, an existing power generating facility that uses a cooling water intake structure and repowers by either replacing or modifying an existing generating unit would remain subject to regulation as a Phase II existing facility, unless the existing facility were completely demolished and another facility constructed in its place that used either a new intake structure or the existing structure with an increased design capacity. For

example, the following facility modifications or additions would result in a facility being characterized as an existing facility under today's rule:

- An existing power generating facility undergoes a modification of its process short of total replacement of the process and concurrently increases the design capacity of its existing cooling water intake structures;

- An existing power generating facility builds a new process at its site for purposes of the same industrial operation and concurrently increases the design capacity of its existing cooling water intake structures;

- An existing power generating facility completely rebuilds its process but uses the existing cooling water intake structure with no increase in design capacity.

Phase II existing facilities subject to today's rule include point sources that do not presently use, but propose to use, cooling water intake structures and do not meet the definition of new facility at § 125.83. This is appropriate because there may be some cases in which an existing facility historically withdrew its cooling water from a municipal or other source, but then decides to withdraw cooling water from a water of the United States. In these cases, the facility may not previously have met all of the criteria applicable to an existing facility under today's rule (*i.e.*, the facility did not previously withdraw cooling waters from a water of the United States) but may make changes that would place the facility within the scope of today's rule. A comparable situation would

be when a facility previously relied on units that do not require cooling water, and then adds or modifies a unit for purposes of the same industrial operation (*i.e.*, power generation) such that cooling water is subsequently required. For example, an existing power generating facility that adds a new generating unit at the same site for purposes of repowering and concurrently increases the design capacity of its existing cooling water intake structure(s), or adds a new intake structure where it did not previously need one, for example when converting a gas turbine to a combined cycle unit, would be considered an existing facility.

In the preamble to the Phase I rule, EPA noted that it had defined "existing facility" in a manner consistent with existing NPDES regulations with a limited exception. EPA noted that it had generally deferred regulation of new sources constructed on a site at which an existing source is located until the Agency had completed analysis of its survey data on existing facilities. . Accordingly, the Phase I rule treated almost all changes to existing facilities for purposes of the same industrial operation as existing facilities. These included the addition of new generating units at the same site, even where they required an increase in cooling water intake structure design capacity or the construction of a new cooling water intake structure, as well as the complete demolition of an existing facility and its replacement with a new facility, so long as it did not increase the design capacity of the cooling water intake structure. The only exception was the demolition of an existing facility and its replacement with a new facility accompanied by an increase in design capacity of the cooling water intake structure.

As the preamble explained: "The definition of a new facility in the final rule applies to a facility that is repowered only if the existing facility has been demolished and another facility is constructed in its place, and modifies the existing cooling water intake structure to increase the design intake capacity." *Id.*[2a] By contrast, the Phase I rule treated the addition of a new unit for purposes of a different industrial operation as an existing facility only if it used an existing cooling water intake structure whose design intake flow was not increased.

The Phase II proposed rule continued this approach in its definition of "existing facility." It continued to treat all changes to existing facilities for purposes of the same industrial operation as an existing facility unless the change was a complete demolition and replacement of the facility accompanied by an increase in cooling water intake design capacity. It also continued to treat the addition of new units for purposes of a different industrial operation differently, only allowing them to be "existing facilities" if they used an existing cooling water intake structure and did not increase

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[2a] Because they are part of the same "industrial operation," such units are not "stand-alone" facilities for purposes of the "new facility" definition. As the fifth sentence of the definition of "new facility" explains, they are categorically treated as "existing facilities" regardless of any other considerations unless they completely replace an existing facility and its cooling water design intake capacity is increased. Accordingly, there is thus no need to make a determination whether they are "substantially independent" of the existing facility at the same site under the fourth sentence of the definition in order to determine whether they are "existing" or "new facilities." The fifth sentence alone controls that question.

its design intake flow. 67 FR 17221. In putting forth this proposed definition, EPA noted that it had collected data from a variety of sources, including survey data, specifically relating to repowering facilities. *Id.* at 17131–17135. It also made a point of explaining the wide variety of repowering activities that an existing facility could undertake under the proposed rule—anything short of demolition of an existing facility and its replacement with a new facility combined with increasing the design capacity of a cooling water intake structure—while still being regulated as an "existing facility" rather than a "new facility." *Id.* at 17128.

On the basis of the analysis of the survey data and other information in the record, the Agency now has concluded that it should adhere to its provisional **[*41580]** decision generally giving wide latitude to existing facilities to make changes or additions to their facilities at the same site. In particular, new units that are added to a facility for purposes of the same general industrial operation should be treated as existing facilities because limitations associated with an existing site make it inappropriate to subject such units to new facility requirements. These limitations include space, existing location on a waterbody, location in already congested areas which could affect (if Phase 1 requirements were applied) visibility impairment, highway and airport safety issues, noise abatement issues, salt drift and corrosion problems and additional energy requirements. Moreover, power generation facilities should not be discouraged from making any upgrade, modification, or repowering that would increase energy efficiency or supply out of concern that they would be considered a new facility for purposes of

section 316(b). Additional benefits will be realized in terms of reducing industrial sprawl if incremental power generation is not discouraged at existing power generation sites. These considerations counsel in favor of treating new units locating at existing sites as existing rather than new facilities. EPA also noted when it promulgated the Phase I rule (*see* 66 FR 65286) that it is not feasible for the permit authority to judge whether the facility could have been located elsewhere for the purpose of determining whether the facility is subject to the new facility rules. Accordingly, EPA has decided to retain the Phase I definition's provision that a new facility does not include new units that are added to a facility for purposes of the same general industrial operation. As noted above, this decision is fully consistent with the approach to this issue laid out in the proposed Phase II rule.

The final rule definition of "existing facility" is sufficiently broad that it encompasses facilities that will be addressed under the Phase III rule (*e.g.*, existing power generating facilities with design flows below the 50 MGD threshold, certain existing manufacturing facilities, seafood processors, and offshore and coastal oil and gas extraction facilities). EPA notes, however, that these facilities are not covered under this rule because they do not meet the requirements of § 125.91.

B. What Is "Cooling Water" and What Is a "Cooling Water Intake Structure?"

Today's rule adopts for Phase II existing facilities the same definition of a "cooling water intake structure" that applies to new facilities. A cooling water intake structure is defined as the total

physical structure and any associated constructed waterways used to withdraw cooling water from waters of the United States. Under the definition in today's rule, the cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps. Today's rule adopts the new facility rule's definition of "cooling water": Water used for contact or noncontact cooling, including water used for equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The definition specifies that the intended use of cooling water is to absorb waste heat rejected from the processes used, or auxiliary operations on the facility's premises. The definition also indicates that water used in a manufacturing process either before or after it is used for cooling is process water for both cooling and non-cooling purposes and would not be considered cooling water for purposes of determining whether 25 percent or more of the flow is cooling water. This clarification is necessary because cooling water intake structures typically bring water into a facility for numerous purposes, including industrial processes; use as circulating water, service water, or evaporative cooling tower makeup water; dilution of effluent heat content; equipment cooling; and air conditioning. EPA notes that this clarification does not change the fact that only the intake water used exclusively for cooling purposes is counted when determining whether the 25 percent threshold in § 125.91(a)(4) is met.

This definition of "cooling water intake structure" differs from the definition provided in the 1977 Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic

Environment: Section 316(b) P.L. 92-500 (U.S. EPA, 1977). The final rule definition clarifies that the cooling water intake structure includes the physical structure that extends from the point at which water is withdrawn from the surface water up to and including the intake pumps. Inclusion of the term "associated constructed waterways" in today's rule is intended to clarify that the definition includes those canals, channels, connecting waterways, and similar structures that may be built or modified to facilitate the withdrawal of cooling water. The explicit inclusion of the intake pumps in the definition reflects the key role pumps play in determining the capacity (*i.e.*, dynamic capacity) of the intake. These pumps, which bring in water, are an essential component of the cooling water intake structure since without them the intake could not work as designed.

C. Is My Facility Covered if It Withdraws From Waters of the United States?

The requirements finalized today apply to cooling water intake structures that have the design capacity to withdraw amounts of water equal to or greater than the specified intake flow threshold from "waters of the United States." Waters of the United States include the broad range of surface waters that meet the regulatory definition at 40 CFR 122.2, which includes lakes, ponds, reservoirs, nontidal rivers or streams, tidal rivers, estuaries, fjords, oceans, bays, and coves. These potential sources of cooling water may be adversely affected by impingement and entrainment.

Some facilities discharge heated water to cooling ponds, then withdraw water from the ponds for

cooling purposes. EPA recognizes that cooling ponds may, in certain circumstances, constitute part of a closed-cycled cooling system. See, *e.g.*, 40 CFR 125.83. However, EPA does not intend this rule to change the regulatory status of cooling ponds. Cooling ponds are neither categorically included nor categorically excluded from the definition of "waters of the United States" at 40 CFR 122.2. EPA interprets to give permit writers discretion to regulate cooling ponds as "waters of the United States" where cooling ponds meet the definition of "waters of the United States." The determination whether a particular cooling pond is or is not a water of the United States is to be made by the permit writer on a case-by-case basis, informed by the principles enunciated in Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001). Therefore, facilities that withdraw cooling water from cooling ponds that are waters of the United States and that meet today's other criteria for coverage (including the requirement that the facility has or will be required to obtain an NPDES permit) are subject to today's rule. The EPA and the U.S. Army Corps of Engineers have jointly issued jurisdictional guidance concerning the term "waters of the United States" in light of the Supreme Court's decision in Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001) (SWANCC). A copy of that guidance was published as an Appendix to an Advanced Notice of Proposed **[*41581]** Rulemaking on the definition of the phrase "waters of the U.S.," see 68 FR 1991 (January 15, 2003), and may be obtained at (http://www.epa.gov/owow/wetlands/ANPRM-FR.pdf). Section 125.91(d) also

provides, similar to the new facility rule, that facilities that obtain cooling water from a public water system or use treated effluent are not deemed to be using a cooling water intake structure for purposes of this rule.

D. Is My Facility Covered if It Is a Point Source Discharger?

Today's rule applies only to facilities that are point sources (*i.e.*, have an NPDES permit or are required to obtain one) because they discharge or might discharge pollutants, including storm water, from a point source to waters of the Unites States. This is the same requirement EPA included in the Phase I new facility rule at 40 CFR 125.81(a)(1). Requirements for complying with section 316(b) will continue to be applied through NPDES permits.

Based on the Agency's review of potential Phase II existing facilities that employ cooling water intake structures, the Agency anticipates that most existing power generating facilities that will be subject to this rule will control the intake structure that supplies them with cooling water, and discharge some combination of their cooling water, wastewater, and storm water to a water of the United States through a point source regulated by an NPDES permit. In this scenario, the requirements for the cooling water intake structure will be specified in the facility's NPDES permit. In the event that a Phase II existing facility's only NPDES permit is a general permit for storm water discharges, the Agency anticipates that the Director would write an individual NPDES permit containing requirements for the facility's cooling water intake structure. Alternatively, requirements applicable to cooling water intake

structures could be incorporated into general permits. If requirements are placed into a general permit, they must meet the criteria set out at 40 CFR 122.28.

The Agency also recognizes that some facilities that have or are required to have an NPDES permit might not own and operate the intake structure that supplies their facility with cooling water. For example, electric power-generating facilities operated by separate entities might be located on the same, adjacent, or nearby property(ies); one of these facilities might take in cooling water and then transfer it to other facilities prior to discharge of the cooling water to a water of the United States. Section 125.91(c) of today's rule addresses such a situation. It provides that use of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with one or more independent suppliers of cooling water if the supplier or suppliers withdraw water from waters of the United States but that is not itself a Phase II existing facility. This provision is intended to prevent facilities from circumventing the requirements of today's rule by creating arrangements to receive cooling water from an entity that is not itself a Phase II existing facility.

In addressing facilities that have or are required to have an NPDES permit that do not directly control the intake structure that supplies their facility with cooling water, section 125.91(d) also provides, similar to the new facility rule, that facilities that obtain cooling water from a public water system or use treated effluent are not deemed to be using a cooling water intake structure for purposes of this rule.

As EPA stated in the preamble to the final Phase I rule (66 FR 65256 December 18, 2001), the Agency encourages the Director to closely examine scenarios in which a facility withdraws significant amounts of cooling water from waters of the United States but is not required to obtain an NPDES permit. As appropriate, the Director should apply other legal requirements, such as section 404 or 401 of the Clean Water Act, the Coastal Zone Management Act, the National Environmental Policy Act, the Endangered Species Act, or similar State or Tribal authorities to address adverse environmental impact caused by cooling water intake structures at those facilities.

E. What Cooling Water Use and Design Intake Flow Thresholds Result in an Existing Facility Being Subject to This Rule?

This final rule applies to existing facilities that are point sources and use cooling water intake structures that (1) withdraw cooling water from waters of the United States and use at least twenty-five (25) percent of the water withdrawn exclusively for cooling purposes, and (2) have a total design intake capacity of 50 MGD or more measured on an average annual basis (see § 125.91). Today's rule further provides that where a Phase II existing facility is co-located with a manufacturing facility, only that portion of the cooling water intake flow that is used by the Phase II facility to generate electricity for sale to another entity will be considered for purposes of determining whether the 50 MGD and 25 percent criteria have been exceeded.

EPA chose the 50 MGD threshold to focus the rule on the largest existing power generating facilities. EPA estimates that the 50 MGD threshold will

subject approximately 543 of 902 (60 percent) existing power generating facilities to this final rule and will address approximately 90 percent of the total flow withdrawn by these facilities. EPA established the 50 MGD threshold because the regulation of existing facilities with flows of 50 MGD or greater in Phase II will address those existing power generating facilities with the greatest potential to cause or contribute to adverse environmental impact. In addition, EPA has limited data on impacts at facilities withdrawing less than 50 MGD. Deferring regulation of such facilities to Phase III provides an additional opportunity for the Agency to collect impingement and entrainment data for these smaller facilities.

Similarly, because Phase II existing facilities typically use far more than 25 percent of the water they withdraw for cooling purposes, EPA established the 25 percent threshold to ensure that nearly all cooling water and the largest existing facilities using cooling water intake structures are addressed by today's requirements. As in the Phase I rule, water used for both cooling and non-cooling purposes does not count towards the 25 percent threshold. Thus, the rule does not discourage the reuse of cooling water as process water or vice versa. Water that serves as cooling water but is either previously or subsequently used as process water is not considered cooling water for purposes of determining the percentage of the water withdrawn that is used for cooling and whether that percentage equals or exceeds 25 percent. Water withdrawn for non-cooling purposes includes water withdrawn for warming by liquified natural gas facilities and water

withdrawn for public water systems by desalinization facilities.

III. Legal Authority, Purpose, and Background of Today's Regulation

A. Legal Authority

Today's final rule is issued under the authority of sections 101, 301, 304, 308, 316, 401, 402, 501, and 510 of the Clean Water Act (CWA), 33 U.S.C. § 1251. 1311. 1314. 1318, 1326, 1341, 1342, 1361. and 1370. This rule partially fulfills the obligations of the U.S. Environmental Protection Agency (EPA) under a consent decree in *Riverkeeper, Inc. v. Leavitt*, No. 93 Civ. 0314, (S.D.N.Y). **[*41582]**

B. Purpose of Today's Regulation

Section 316(b) of the CWA provides that any standard established pursuant to section 301 or 306 of the CWA and applicable to a point source must require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. Today's rule establishes requirements reflecting the best technology available for minimizing adverse environmental impact, applicable to the location, design, construction, and capacity of cooling water intake structures at Phase II existing power generating facilities that have the design capacity to withdraw at least fifty (50) MGD of cooling water from waters of the United States and use at least twenty-five (25) percent of the water they withdraw exclusively for cooling purposes.

C. Background

1. The Clean Water Act

The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), 33 U.S.C. 1251 *et seq.*, seeks to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." 33 U.S.C. 1251(a). The CWA establishes a comprehensive regulatory program, key elements of which are (1) a prohibition on the discharge of pollutants from point sources to waters of the United States, except as authorized by the statute; (2) authority for EPA or authorized States or Tribes to issue National Pollutant Discharge Elimination System (NPDES) permits that regulate the discharge of pollutants; (3) requirements for limitations in NPDES permits based on effluent limitations guidelines and standards and water quality standards.

Today's rule implements section 316(b) of the CWA as it applies to "Phase II existing facilities" as defined in this rule. Section 316(b) addresses the adverse environmental impact caused by the intake of cooling water, not discharges into water. Despite this special focus, the requirements of section 316(b) are closely linked to several of the core elements of the NPDES permit program established under section 402 of the CWA to control discharges of pollutants into navigable waters. For example, while effluent limitations apply to the discharge of pollutants by NPDES-permitted point sources to waters of the United States, section 316(b) applies to facilities subject to NPDES requirements that withdraw water from waters of the United States for cooling and that use a cooling water intake structure to do so.

Section 402 of the CWA provides authority for EPA or an authorized State or Tribe to issue an NPDES permit to any person discharging any pollutant or combination of pollutants from a point source into waters of the United States. Forty-five States and one U.S. territory are authorized under section 402(b) to administer the NPDES permitting program. NPDES permits restrict the types and amounts of pollutants, including heat, that may be discharged from various industrial, commercial, and other sources of wastewater. These permits control the discharge of pollutants primarily by requiring dischargers to meet effluent limitations established pursuant to or . Effluent limitations may be based on promulgated Federal effluent limitations guidelines, new source performance standards, or the best professional judgment of the permit writer. Limitations based on these guidelines, standards, or best professional judgment are known as technology-based effluent limits. Where technology-based effluent limits are inadequate to ensure attainment of water quality standards applicable to the receiving water, section 301(b)(1)(C) of the Clean Water Act requires permits to include more stringent limits based on applicable water quality standards. NPDES permits also routinely include monitoring and reporting requirements, standard conditions, and special conditions. In addition, NPDES permits contain conditions to implement the requirements of section 316(b). Section 301 of the CWA prohibits the discharge of any pollutant by any person, except in compliance with specified statutory requirements, including section 402.

Section 510 of the Clean Water Act provides, that except as provided in the Clean Water Act, nothing

in the Act shall (1) preclude or deny the right of any State or political subdivision thereof to adopt or enforce any requirement respecting control or abatement of pollution; except that if a limitation, prohibition or standard of performance is in effect under the Clean Water Act, such State or political subdivision may not adopt or enforce any other limitation prohibition or standard of performance which is less stringent than the limitation prohibition or standard of performance under the Act. EPA interprets this to reserve for the States authority to implement requirements that are more stringent than the Federal requirements under state law. *PUD No. 1 of Jefferson County [v]. Washington Dep't of Ecology*, 511 U.S. 700, 705 (1994).

Sections 301, 304, and 306 of the CWA require that EPA develop technology-based effluent limitations guidelines and new source performance standards that are used as the basis for technology-based minimum discharge requirements in wastewater discharge permits. EPA issues these effluent limitations guidelines and standards for categories of industrial dischargers based on the pollutants of concern discharged by the industry, the degree of control that can be attained using various levels of pollution control technology, consideration of various economic tests appropriate to each level of control, and other factors identified in sections 304 and 306 of the CWA (such as non-water quality environmental impacts including energy impacts). EPA has promulgated regulations setting effluent limitations guidelines and standards under sections 301, 304, and 306 of the CWA for more than 50 industries. See 40 CFR parts 405 through 471. EPA has established effluent limitations guidelines and

standards that apply to most of the industry categories that use cooling water intake structures (*e.g.*, steam electric power generation, iron and steel manufacturing, pulp and paper manufacturing, petroleum refining, and chemical manufacturing).

Section 316(b) states, in full:

> Any standard established pursuant to section 301 or section 306 of [the Clean Water] Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

The phrase "best technology available" in CWA section 316(b) is not defined in the statute, but its meaning can be understood in light of similar phrases used elsewhere in the CWA. See *Riverkeeper v. EPA*, slip op. at 11 (2nd Cir. Feb. 3, 2004) (noting that the cross-reference in CWA section 316(b) to CWA "is an invitation to look to for guidance in discerning what factors Congress intended the EPA to consider in determining the 'best technology available'" for new sources).

In sections 301 and 306, Congress directed EPA to set effluent discharge standards for new sources based on the "best available demonstrated control technology" and for existing sources based on the "best available technology economically achievable." For new sources, section 306(b)(1)(B) directs EPA to establish "standards of performance." The phrase "standards of performance" under section 306(a)(1) is defined as being the effluent reduction that is **[*41583]** "achievable through application of the best

available demonstrated control technology, processes, operating methods or other alternatives * * *." This is commonly referred to as "best available demonstrated technology" or "BADT." For existing dischargers, section 301(b)(1)(A) requires the establishment of effluent limitations based on "the application of best practicable control technology currently available." This is commonly referred to as "best practicable technology" or "BPT." Further, section 301(b)(2)(A) directs EPA to establish effluent limitations for certain classes of pollutants "which shall require the application of the best available technology economically achievable." This is commonly referred to as "best available technology" or "BAT." Section 301 specifies that both BPT and BAT limitations must reflect determinations made by EPA under Clean Water Act section 304. Under these provisions, the discharge of pollutants from point sources is based not on the impact of the discharge on the receiving waters, but instead upon the capabilities of the equipment or "control technologies" available to control those discharges.

The phrases "best available demonstrated technology"; and "best available technology"—like "best technology available" in CWA section 316(b)—are not defined in the statute. However, section 304 of the CWA specifies factors to be considered in establishing the best practicable control technology currently available, and best available technology.

For best practicable control technology currently available, the CWA directs EPA to consider

> the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also

> take into account the age of the equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as [EPA] deems appropriate.

33 U.S.C. 1314(b)(1)(b) [*sic*: should be "(B)].

For "best available technology," the CWA directs EPA to consider:

> the age of equipment and facilities involved, the process employed, the engineering aspects * * * of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impacts (including energy requirements), and such other factors as [EPA] deems appropriate.

33 U.S.C. 1314(b)(2)(B).

Section 316(b) expressly refers to section 301, and the phrase "best technology available" is very similar to "best technology available" in that section. These facts, coupled with the brevity of section 316(b) itself, prompted EPA to look to section 301 and, ultimately, section 304 for guidance in determining the "best technology available to minimize adverse environmental impact" of cooling water intake structures for existing Phase II facilities.

By the same token, however, there are significant differences between section 316(b) and sections 301 and 304. See *Riverkeeper, Inc. v. United States Environmental Protection Agency*, slip op. at 13, (2nd Cir. Feb. 3, 2004) ("not every statutory directive contained [in sections 301 and 306] is applicable" to a

section 316(b) rulemaking). Section 316(b) requires that cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. In contrast to the effluent limitations provisions, the object of the "best technology available" is explicitly articulated by reference to the receiving water: To minimize adverse environmental impact in the waters from which cooling water is withdrawn. This difference is reflected in EPA's past practices in implementing sections 301, 304, and 316(b). While EPA has established effluent limitations guidelines based on the efficacy of one or more technologies to reduce pollutants in wastewater in relation to cost without necessarily considering the impact on the receiving waters, EPA has previously considered the costs of technologies in relation to the benefits of minimizing adverse environmental impact in establishing 316(b) limits which historically have been done on a case-by case basis. *In Re Public Service Co. of New Hampshire*, 10 ERC 1257 (June 17, 1977); *In Re Public Service Co. of New Hampshire*, 1 EAD 455 (Aug. 4, 1978); *Seacoast Anti-Pollution League* v. *Costle*, 597 F. 2d 306 (1st Cir. 1976).

For this Phase II rulemaking, EPA therefore interprets CWA section 316(b) as authorizing EPA to consider not only technologies but also their effects on and benefits to the water from which the cooling water is withdrawn. Based on these two considerations, EPA has established in today's rule national requirements for facilities to install technology that is technically available, economically practicable, and cost-effective while at the same time authorizing a range of technologies that achieve

comparable reductions in adverse environmental impact.

2. Consent Decree

Today's final rule partially fulfills EPA's obligation to comply with a consent decree, as amended. The Second Amended Consent Decree, which is relevant to today's rule, was filed on November 25, 2002, in the United States District Court, Southern District of New York, in *Riverkeeper, Inc.* v. *Leavitt*, No. 93 Civ 0314, a case brought against EPA by a coalition of individuals and environmental groups. The original Consent Decree, filed on October 10, 1995, provided that EPA was to propose regulations implementing section 316(b) by July 2, 1999, and take final action with respect to those regulations by August 13, 2001. Under subsequent interim orders, the Amended Consent Decree filed on November 22, 2000, and the Second Amended Consent Decree, EPA has divided the rulemaking into three phases and is working under new deadlines. As required by the Second Amended Consent Decree, on November 9, 2001, EPA took final action on a rule governing cooling water intake structures used by new facilities (Phase I). 66 FR 65255 (December 18, 2001). The Second Amended Consent Decree requires that EPA take final action by February 16, 2004, with respect to Phase II regulations that are "applicable to, at a minimum: (1) Existing utilities (*i.e.*, facilities that both generate and transmit electric power) that employ a cooling water intake structure, and whose intake flow levels exceed a minimum threshold to be determined by EPA during the Phase II rulemaking process; and (2) existing nonutility power producers (*i.e.*, facilities that generate electric power but sell it

to another entity for transmission) that employ a cooling water intake structure, and whose intake flow levels exceed a minimum threshold to be determined by EPA during the Phase II rulemaking process." The consent decree further requires that EPA propose regulations governing cooling water intake structures used, at a minimum, by smaller-flow power plants and facilities in four industrial sectors (pulp and paper making, petroleum and coal products manufacturing, chemical and allied manufacturing, and primary metal manufacturing) by November 1, 2004, and take final action by June 1, 2006 (Phase III).

3. What Other EPA Rulemakings and Guidance Have Addressed Cooling Water Intake Structures?

In April 1976, EPA published a final rule under section 316(b) that addressed cooling water intake structures. 41 FR **[*41584]** 17387 (April 26, 1976), see also the proposed rule at 38 FR 34410 (December 13, 1973). The rule added a new Chapter I that reiterated the requirements of CWA section 316(b). It also added a new part 402, which included three sections: (1) § 402.10 (Applicability), (2) § 402.11 (Specialized definitions), and (3) § 402.12 (Best technology available for cooling water intake structures). Section 402.10 stated that the provisions of part 402 applied to "cooling water intake structures for point sources for which effluent limitations are established pursuant to section 301 or standards of performance are established pursuant to section 306 of the Act." Section 402.11 defined the terms "cooling water intake structure," "location," "design," "construction," "capacity," and

"Development Document." Section 402.12 included the following language:

> The information contained in the Development Document shall be considered in determining whether the location, design, construction, and capacity of a cooling water intake structure of a point source subject to standards established under or reflect the best technology available for minimizing adverse environmental impact.

In 1977, fifty-eight electric utility companies challenged those regulations, arguing that EPA had failed to comply with the requirements of the Administrative Procedure Act (APA) in promulgating the rule. Specifically, the utilities argued that EPA had neither published the Development Document in the **Federal Register** nor properly incorporated the document into the rule by reference. The United States Court of Appeals for the Fourth Circuit agreed and, without reaching the merits of the regulations themselves, remanded the rule. *Appalachian Power Co.* v. *Train*, 566 F.2d 451 (4th Cir. 1977). EPA later withdrew part 402. 44 FR 32956 (June 7, 1979). The regulation at 40 CFR 401.14, which reiterates the statutory requirement, remains in effect.

Since the Fourth Circuit remanded EPA's section 316(b) regulations in 1977, NPDES permit authorities have made decisions implementing section 316(b) on a case-by-case, site-specific basis. EPA published draft guidance addressing section 316(b) implementation in 1977. See *Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b) P.L. 92-500* (U.S. EPA, 1977). This draft guidance described the studies recommended

for evaluating the impact of cooling water intake structures on the aquatic environment and recommended a basis for determining the best technology available for minimizing adverse environmental impact. The 1977 section 316(b) draft guidance states, "The environmental-intake interactions in question are highly site-specific and the decision as to best technology available for intake design, location, construction, and capacity must be made on a case-by-case basis." (Section 316(b) Draft Guidance, U.S. EPA, 1977, p. 4). This case-by-case approach was also consistent with the approach described in the 1976 Development Document referenced in the remanded regulation.

The 1977 section 316(b) draft guidance suggested a general process for developing information needed to support section 316(b) decisions and presenting that information to the permitting authority. The process involved the development of a site-specific study of the environmental effects associated with each facility that uses one or more cooling water intake structures, as well as consideration of that study by the permitting authority in determining whether the facility must make any changes for minimizing adverse environmental impact. Where adverse environmental impact is present, the 1977 draft guidance suggested a stepwise approach that considers screening systems, size, location, capacity, and other factors.

Although the draft guidance described the information that should be developed, key factors that should be considered, and a process for supporting section 316(b) determinations, it did not establish uniform technology-based national

standards for best technology available for minimizing adverse environmental impact. Rather, the guidance left the decisions on the appropriate location, design, capacity, and construction of cooling water intake structures to the permitting authority. Under this framework, the Director determined whether appropriate studies have been performed, whether a given facility has minimized adverse environmental impact, and what, if any, technologies may be required.

4. Phase I New Facility Rule

On November 9, 2001, EPA took final action on regulations governing cooling water intake structures at new facilities. 66 FR 65255 (December 18, 2001). On December 26, 2002, EPA made minor changes to the Phase I regulations. 67 FR 78947. The final Phase I new facility rule (40 CFR Part 125, Subpart I) establishes requirements applicable to the location, design, construction, and capacity of cooling water intake structures at new facilities that withdraw at least two (2) million gallons per day (MGD) and use at least twenty-five (25) percent of the water they withdraw solely for cooling purposes. In the new facility rule, EPA adopted a two-track approach. Under Track I, for facilities with a design intake flow more than 10 MGD, the intake flow of the cooling water intake structure is restricted, at a minimum, to a level commensurate with that which could be attained by use of a closed-cycle, recirculating cooling system. For facilities with a design intake flow more than 2 MGD, the design through-screen intake velocity is restricted to 0.5 ft/s and the total quantity of intake is restricted to a proportion of the mean annual flow of a freshwater

river or stream, or to maintain the natural thermal stratification or turnover patterns (where present) of a lake or reservoir except in cases where the disruption is beneficial, or to a percentage of the tidal excursions of a tidal river or estuary. If certain environmental conditions exist, an applicant with intake capacity greater than 10 MGD must select and implement appropriate design and construction technologies for minimizing impingement mortality and entrainment. (Applicants with 2 to 10 MGD flows are not required to reduce intake flow to a level commensurate with a closed-cycle, recirculating cooling system, but must install technologies for reducing impingement mortality at all locations.) Under Track II, the applicant has the opportunity to demonstrate that impacts to fish and shellfish, including important forage and predator species, within the watershed will be comparable to the reduction in impingement mortality and entrainment it would achieve were it to implement the Track I intake flow and velocity requirements.

With the new facility rule, EPA promulgated national minimum requirements for the design, capacity, and construction of cooling water intake structures at new facilities. EPA believes that the final new facility rule establishes a reasonable framework that creates certainty for permitting of new facilities, while providing significant flexibility to take site-specific factors into account.

5. Proposed Rule for Phase II Existing Facilities

On April 9, 2002, EPA published proposed requirements for cooling water intake structures at Phase II existing facilities to implement section 316(b) of the Clean Water Act. EPA proposed to

establish requirements that gave facilities three different compliance options for meeting performance standards that vary based on waterbody *41585 type, the percentage of the source waterbody withdrawn, and the facility capacity utilization rate. . EPA received numerous comments and data submissions concerning the proposal.

6. Notice of Data Availability

On Wednesday, March 19, 2003, EPA published a Proposed Rule Notice of Data Availability (NODA). 68 FR 13522. This notice presented a summary of the data EPA had received or collected since proposal, an assessment of the relevance of the data to EPA's analysis, revisions to EPA's estimate of the costs and benefits of the proposed rule, new proposed compliance alternatives, and potential modifications to EPA's proposed regulatory approach. As part of the NODA, EPA also reopened the comment period on the complete contents of the proposed rule.

7. Public Participation

EPA has worked extensively with stakeholders from the industry, public interest groups, State agencies, and other Federal agencies in the development of this final rule. These public participation activities have focused on various section 316(b) issues, including issues relevant to development of the Phase I rule and Phase II rule.

EPA conducted outreach to industry groups, environmental groups, and other government entities in the development, testing, refinement, and completion of the section 316(b) survey, which has been used as a source of data for the Phase II rule. The survey is entitled "Information Collection

Request, Detailed Industry Questionnaires: Phase II Cooling Water Intake Structures & Watershed Case Study Short Questionnaire," September 3, 1999. In addition, EPA conducted two public meetings on section 316(b) issues. In June of 1998, in Arlington, Virginia, EPA conducted a public meeting focused on a draft regulatory framework for assessing potential adverse environmental impact from impingement and entrainment. 63 FR 27958 (May 21, 1998). In September of 1998, in Alexandria, Virginia, EPA conducted a public meeting focused on technology, cost, and mitigation issues. 63 FR 40683 (July 30, 1998). In addition, in September of 1998, and April of 1999, EPA staff participated in technical workshops sponsored by the Electric Power Research Institute on issues relating to the definition and assessment of adverse environmental impact. EPA staff have participated in other industry conferences, met upon request on numerous occasions with representatives of industry and environmental groups.

In the months leading up to publication of the proposed Phase I rule, EPA conducted a series of stakeholder meetings to review the draft regulatory framework for the proposed rule and invited stakeholders to provide their recommendations for the Agency's consideration. EPA managers have met with the Utility Water Act Group, Edison Electric Institute, representatives from an individual utility, and with representatives from the petroleum refining, pulp and paper, and iron and steel industries. EPA conducted several meetings with environmental groups attended by representatives from 15 organizations. EPA also met with the Association of State and Interstate Water Pollution

Control Administrators (ASIWPCA) and, with the assistance of ASIWPCA, conducted a conference call in which representatives from 17 States or interstate organizations participated. After publication of the proposed Phase I rule, EPA continued to meet with stakeholders at their request. Summaries of these meetings are in the docket.

EPA received many comments from industry stakeholders, government agencies, and private citizens on the Phase I proposed rule 65 FR 49059 (August 10, 2000). EPA received additional comments on the Phase I Notice of Data Availability (NODA) 66 FR 28853. These comments informed the development of the Phase II proposal.

In January, 2001, EPA also attended technical workshops organized by the Electric Power Research Institute and the Utilities Water Act Group. These workshops focused on the presentation of key issues associated with different regulatory approaches considered under the Phase I proposed rule and alternatives for addressing section 316(b) requirements.

On May 23, 2001, EPA held a day-long forum to discuss specific issues associated with the development of regulations under section 316(b) of the Clean Water Act. 66 FR 20658 (April 24, 2001). At the meeting, 17 experts from industry, public interest groups, States, and academia reviewed and discussed the Agency's preliminary data on cooling water intake structure technologies that are in place at existing facilities and the costs associated with the use of available technologies for reducing impingement and entrainment. Over 120 people attended the meeting.

In August 21, 2001, EPA staff participated in a technical symposium sponsored by the Electric Power Research Institute in association with the American Fisheries Society on issues relating to the definition and assessment of adverse environmental impact under section 316(b) of the CWA.

During development of the Phase I final rule and Phase II proposed rule, EPA coordinated with the staff from the Nuclear Regulatory Commission (NRC) to ensure that there would not be a conflict with NRC safety requirements. NRC staff reviewed the proposed Phase II rule and did not identify any apparent conflict with nuclear plant safety. NRC licensees would continue to be obligated to meet NRC requirements for design and reliable operation of cooling systems. NRC staff recommended that EPA consider adding language which states that in cases of conflict between an EPA requirement under this rule and an NRC safety requirement, the NRC safety requirement take precedence. EPA added language to address this concern in this final rule.

In a concerted effort to respond to a multitude of questions concerning the data and analyses that EPA developed as part of the Phase II proposal, EPA held a number of conference calls with multiple stakeholders to clarify issues and generally provide additional information. To supplement these verbal discussions, EPA drafted three supporting documents: one that explained the methodology EPA used to calculate entrainment rates; and two others that provided specific examples of how EPA applied this methodology to calculate benefits for the proposed rule. In addition, EPA prepared written

responses to all questions submitted by the stakeholders involved in the initial conference calls.

Finally, EPA sponsored a *Symposium on Cooling Water Intake Technologies to Protect Aquatic Organisms*, held on May 6–7, 2003, at the Hilton Crystal City at National Airport in Arlington, Virginia. This symposium brought together professionals from Federal, State, and Tribal regulatory agencies; industry; environmental organizations; engineering consulting firms; science and research organizations; academia; and others concerned with mitigating harm to the aquatic environment by cooling water intake structures. Efficacy and costs of various technologies to mitigate impacts to aquatic organisms from cooling water intake structures, as well as research and other future needs, were discussed.

These coordination efforts and all of the meetings described in this section are documented or summarized in the docket established for this rule.

[*41586] IV. Environmental Impacts Associated With Cooling Water Intake Structures

With the implementation of today's final rule, EPA intends to minimize the adverse environmental impacts of cooling water intake structures by minimizing the number of aquatic organisms lost as a result of water withdrawals associated with these structures or through restoration measures that compensate for these losses. In the Phase I new facility rule and proposed Phase II existing facility rule, EPA provided an overview of the magnitude and type of environmental impacts associated with cooling water intake structures, including several

illustrative examples of documented environmental impacts at existing facilities (*see* 65 FR 49071–4; 66 FR 65262–5; and 67 FR 17136–40).

For the same reasons set forth in the preamble to the Phase I rule (66 FR 65256; 65291–65297), EPA has determined that there are multiple types of undesirable and unacceptable environmental impacts that may be associated with Phase II existing facilities, depending on conditions at the individual site. These types of impacts include entrainment and impingement; reductions of threatened and endangered species; damage to critical aquatic organisms, including important elements of the food chain; diminishment of a population's compensatory reserve; losses to populations including reductions of indigenous species populations, commercial fisheries stocks, and recreational fisheries; and stresses to overall communities and ecosystems as evidenced by reductions in diversity or other changes in system structure and function. Similarly, based on the analyses and for the same reasons set forth in the preamble to the new facility rule (66 FR 65256, 56291–297), EPA has selected reductions in impingement and entrainment as a quick, certain, and consistent metric for determining performance at Phase II existing facilities. Further, EPA considered the non-impingement and entrainment environmental impacts for this rule and found them to be acceptable at a national level. This section describes the environmental impacts associated with cooling water withdrawals and why they are of concern to the Agency.

EPA estimates that facilities under the scope of today's final rule withdraw on average more than

214 billion gallons of cooling water a day from waters of the United States.[2] A report by the U.S. Geological Survey estimates that the use of water by the thermoelectric power industry accounted for 47 percent of all combined fresh and saline withdrawals from waters of the United States in 1995.[3] The withdrawal of such large quantities of cooling water in turn has the potential to affect large quantities of aquatic organisms including phytoplankton (tiny, free-floating photosynthetic organisms suspended in the water column), zooplankton (small aquatic animals, including fish eggs and larvae, that consume phytoplankton and other zooplankton), fish, and shellfish. Aquatic organisms drawn into cooling water intake structures are either impinged on components of the cooling water intake structure or entrained in the cooling water system itself.

Impingement takes place when organisms are trapped against intake screens by the force of the water being drawn through the cooling water intake structure. The velocity of the water withdrawal by the cooling water intake structure may prevent proper gill movement, remove fish scales, and cause other physical harm or death of affected organisms through exhaustion, starvation, asphyxiation, and descaling. Death from impingement ("impingement

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[2] EPA 1999. Detailed Industry Questionnaires: Phase II Cooling Water Intake Structures & Watershed Case Study Short Questionnaire. U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, D.C. OMB Control No. 2040-0213.

[3] Solley, W.B., R.R. Pierce and H.A. Perlman. 1998. Estimated Use of Water in the United States in 1995. U.S. Geological Survey Circular 1200.

mortality") can occur immediately or subsequently as an individual succumbs to physical damage upon its return to the waterbody.

Entrainment occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are typically relatively small, aquatic organisms, including early life stages of fish and shellfish. Many of these small, fragile organisms serve as prey for larger organisms higher on the food chain which are commercially and recreationally desirable species. As entrained organisms pass through a facility's cooling system they may be subject to mechanical, thermal, and at times, chemical stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, sheer stress, thermal shock in the condenser and discharge tunnel, and chemical toxic effects from antifouling agents such as chlorine. Similar to impingement mortality, death from entrainment can occur immediately or subsequently as the individual succumbs to the damage from the stresses encountered as it passed through the cooling water system once it is discharged back into the waterbody.

The environmental impacts attributable to impingement mortality and entrainment at individual facilities include losses of early life stages of fish and shellfish, reductions in forage species, and decreased recreational and commercial landings. EPA estimates that the current number of fish and shellfish, expressed as age 1 equivalents, that are killed from impingement and entrainment from

cooling water intake structures at the facilities covered by this Phase II rule is over 3.4 billion annually. Expressing impingement mortality and entrainment losses as age 1 equivalents is an accepted method for converting losses of all life stages into individuals of an equivalent age and provides a standard metric for comparing losses among species, years, and facilities. The largest losses are in the mid-Atlantic, where EPA estimates 1.7 billion age 1 equivalents are lost annually due to impingement and entrainment.[4] Although the number of age 1 equivalent fish killed by impingement and entrainment is very large, precise quantification of the nature and extent of impacts to populations and ecosystems is difficult. Population dynamics and the physical, chemical, and biological processes of ecosystems are extremely complex. While generally accepted as a simple and transparent method for modeling losses, the proportional methodology that EPA uses to estimate impingement and entrainment nationwide has uncertainties that may result in under or over estimating actual impingement and entrainment rates.

Decreased numbers of aquatic organisms can disrupt aquatic food webs and alter species composition and overall levels of biodiversity. For example, a model that examined the effect of large entrainment losses of forage fish, such as bay

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[4] For more information, please see Chapter D2: Evaluation of Impingement and Entrainment in the Mid-Atlantic Region in the Section 316(b) Existing Facilities Regional Studies, Part D: Mid-Atlantic.

anchovy, predicted subsequent reductions in predator populations (including commercially and recreationally important species such as striped bass, weakfish, and blue fish) as high as 25%.[5] This is because forage species, which comprise a majority of **[*41587]** entrainment losses at many facilities, are often a primary food source for predator species.

EPA is also concerned about the potential impacts of cooling water intake structures located in or near habitat areas that support threatened, endangered, or other species of concern (those species that might be in need of conservation actions, but are not currently listed as threatened or endangered under State or Federal law).[6] In the San Francisco Bay-Delta Estuary, California, in the vicinity of the Pittsburg and Contra Costa Power Plants several fish species (*e.g.*, Delta smelt, Sacramento splittail, chinook salmon, and steelhead) are now considered threatened or endangered by State and/or Federal authorities. EPA evaluated facility data on impingement and entrainment rates for these species and estimated that potential losses of special status fish species at the two facilities may average 8,386 age 1 equivalents per year resulting from impingement and 169 age 1 equivalents per year due

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[5] Summers, J.K. 1989. Simulating the indirect effects of power plant entrainment losses on an estuarine ecosystem. Ecological Modelling, 49: 31–47.

[6] For more information, please see Chapter A12: Threatened & Endangered Species Analysis Methods in the Regional Studies for the Final Section 316(b) Phase II Existing Facilities Rule.

to entrainment.[7] In another example, EPA is aware that from 1976 to 1994, approximately 3,200 threatened or endangered sea turtles entered enclosed cooling water intake canals at the St. Lucie Nuclear Generating Plant in Florida.[8] The facility developed a capture-and-release program in response to these events. Most of the entrapped turtles were captured and released alive; however, approximately 160 turtles did not survive. An incidental take limit established by NMFS in a 2001 biological opinion for this facility has been set at no more than 1,000 sea turtles captured in the intake, with less than one percent killed or injured as a result of plant operations (only two of those killed or injured may be Kemp's Ridley sea turtles and none may be hawksbill or leatherback sea turtles).[9] Although the extent to which threatened, endangered, and other special status species are taken by cooling water intake structures more generally is yet to be determined, EPA is concerned about potential impacts to such species.

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[7] Impingement and entrainment data were obtained from the 2000 Draft Habitat Conservation Plan for the Pittsburg and Contra Costa facilities. Please see EPA's Regional Studies for the Final Section 316(b) Phase II Existing Facilities Rule for detailed information on EPA's evaluation of impingement and entrainment at these facilities.

[8] Florida Power and Light Company. 1995. Assessment of the impacts at the St. Lucie Nuclear Generating Plant on sea turtle species found in the inshore waters of Florida.

[9] Florida Power and Light Company. 2002. Florida Power & Light Company St. Lucie Plant Annual Environmental Operating Report 2002.

Examples of Environmental Impacts Caused by Cooling Water Intakes

1. Hudson River

The power generation facilities on the Hudson River in New York are some of the most extensively studied in the nation. The fish populations in the Hudson River have also been studied extensively to measure the impacts of these power plants. Studies of entrainment at five Hudson River power plants during the 1980s predicted year-class reductions ranging from six percent to 79 percent, depending on the fish species.[10] A Draft Environmental Impact Statement (DEIS) prepared by industry of entrainment at three Hudson River facilities (Roseton, Bowline, and Indian Point) predicted year-class reductions of up to 20 percent for striped bass, 25 percent for bay anchovy, and 43 percent for Atlantic tomcod.[11] The New York State Department of Environmental Conservation (NYSDEC) concluded that any "compensatory responses to this level of power plant mortality could seriously deplete any resilience or compensatory capacity of the species needed to survive unfavorable environmental conditions."[12] In the DEIS, the facilities argue that

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[10] Boreman J. and P. Goodyear. 1988. Estimates of entrainment mortality for striped bass and other fish species inhabiting the Hudson River Estuary. American Fisheries Society Monograph 4:152–160.

[11] FN11 Consolidated Edison Company of New York. 2000. Draft environmental impact statement for the state pollutant discharge elimination system permits for Bowline Point, Indian Point 2 & 3, and Roseton steam electric generating stations.

[12] New York State Department of Environmental Conservation (NYSDEC). 2000. Internal memorandum

their operation has not harmed the local aquatic communities, because all observed population changes are attributable to causes other than the operation of the power plants, such as water chestnut growth, zebra mussel invasion, changes in commercial fishing, increases in salinity and improved water quality in the New York Harbor.

In contrast, the Final Environmental Impact Statement (FEIS) prepared by NYSDEC for these three facilities concludes that impacts are associated with the power plants and notes that these impacts are more like habitat degradation than the "selective cropping" of fish that occurs during regulated fishing because the entire community is impacted rather than specific species higher on the food chain.[13] The multiple facilities on the Hudson River act cumulatively on the entire aquatic community. New York State's 2002 section 316(b) report lists the Hudson River downstream from the Federal dam at Troy, New York, as impacted by cooling water use by power plants due to the loss each year of a substantial percentage of annual fish production. The FEIS estimates, from samples collected between 1981 and 1987, that the average annual entrainment losses from these three facilities includes 16.9 million

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provided to the USEPA on NYDEC's position on SPDES permit renewals for Roseton, Bowline Point 1 & 2, and Indian Point 2 & 3 generating stations.

[13] New York State Department of Environmental Conservation (NYSDEC). 2003. Final Environmental Impact Statement: Concerning the Applications to Renew NYSPDES Permits for the Roseton 1 & 2, Bowling 1 & 2 and Indian Point 2 & 3 Steam Electric Generating Stations, Orange, Rockland and Westchester Counties.

American shad, 303.4 million striped bass, 409.6 million bay anchovy, 468 million white perch, and 826.2 million river herring.[14] In addition, related studies have found a small long-term decline in both species richness and diversity within the resident fish community. A commenter on the DEIS cited further evidence that Atlantic tomcod, Atlantic sturgeon, bluefish, weakfish, rainbow smelt, white perch and white catfish are showing long-term trends of declining abundance of 5 to 8% per annum.[15] Declines in abundances of several species and changes in species composition have raised concerns about the overall health of the community. The FEIS concluded that additional technology was necessary to minimize the adverse environmental impact from

The FEIS further concluded that entrainment at these facilities has diminished the forage base for each species so there is less food available for the survivors. This disruption of the food chain compromises the health of the entire aquatic community. The FEIS used, as a simplified hypothetical example, the loss of an individual bay anchovy that would ordinarily serve as prey for a juvenile striped bass. If this individual bay anchovy is killed via entrainment and disintegrated upon **[*41588]** passage through a CWIS, it is no longer

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[14] Ibid.

[15] Henderson, P.A. and R.M. Seaby. 2000. Technical comments on the Draft Environmental Impact Statement for the State Pollution Discharge Elimination System Permit Renewal for Bowline Point 1 & 2, Indian Point 2 & 3, and Roseton 1 & 2 Steam Generating Stations. Pisces Conservation Ltd.

available as food to a striped bass, but rather it is only useful as food to lower trophic level organisms, such as detritivores (organisms that feed on dead organic material). Further, the bay anchovy would no longer be available to consume phytoplankton, which upsets the distribution of nutrients in the ecosystem.[17]

The Hudson River, like many waterbodies in the nation, has undergone many changes in the past few decades. These changes, which have affected fish populations either positively or negatively, include improvements to water quality as a result of upgrades to sewage treatment plants, invasions by exotic species such as zebra mussels, chemical contamination by toxins such as PCBs and heavy metals, global climate shifts such as increases in annual mean temperatures and higher frequencies of extreme weather events (*e.g.*, the El Niño-Southern Oscillation), and strict management of individual species stocks such as striped bass.[18] In addition, there are dramatic natural changes in fish populations on an annual basis and in the long term due to natural phenomena because the Hudson River, like many waterbodies, is a dynamic system with many fundamental, fluctuating environmental parameters—such as flow, temperature, salinity, dissolved oxygen, nutrients, and disease—that cause natural variation in fish populations each year.[19] The existence of these interacting variables makes it

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[17] Ibid.

[18] Ibid.

[19] Ibid.

difficult to determine the exact contribution of impingement and entrainment losses on a population's relative health. Nonetheless, as described later in this section, EPA is concerned about the potential for cumulative impacts resulting from multiple facility intakes that collectively impinge and/or entrain aquatic organisms within a specific waterbody.

2. Mount Hope Bay

Environmental impacts were also studied in another recent permit reissuance for the Brayton Point Station in Somerset, Massachusetts, where EPA is the permitting authority. EPA determined that, among other things, the facility's cooling water system had contributed to the collapse of the fishery and inhibited its recovery despite stricter commercial and recreational fishing limits and improved water quality due to sewage treatment upgrades. The facility currently withdraws nearly one billion gallons of water each day and the average annual losses of aquatic organisms due to impingement and entrainment are estimated in the trillions, including 251 million winter flounder, 375 million windowpane flounder, 3.5 billion tautog and 11.8 billion bay anchovy. A dramatic change in the fish populations in Mount Hope Bay is apparent after 1984 with a decline by more than 87 percent, which coincides with a 45 percent increase in cooling water withdrawal from the bay due to the modification of Unit 4 from a closed-cycle recirculating system to a once-through cooling water system and a similar increase in the facility's thermal discharge.[20] [21] The

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[20] Ibid.

downward trend of finfish abundance in Mount Hope Bay is significantly greater than declines in adjacent Narragansett Bay that is not influenced by the operation of Brayton Point Station.[22] Despite fishing restrictions, fish stocks have not recovered

3. Southern California Bight

At the San Onofre Nuclear Generating Station (SONGS), in a normal (non-El Niño) year, an estimated 57 tons of fish were killed per year when all units were in operation.[23] The amount lost per year included approximately 350,000 juveniles of white croaker, a popular sport fish; this number represents 33,000 adult equivalents or 3.5 tons of adult fish. In shallow water, densities of queenfish and white croaker decreased 60 percent within one kilometer of SONGS and 35 percent within three kilometers from SONGS as compared to densities prior to facility operations. Densities of local midwater fish decreased 50 to 70 percent within three kilometers of the facility. In contrast, relative abundances of some bottom-dwelling species in the same areas were higher because of the enriched

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[21] T Gibson, M. 1995 (revised 1996). Comparison of trends in the finfish assemblages of Mt. Hope Bay and Narragansett Bay in relation to operations for the New England Power Brayton Point station. Rhode Island Division of Fish and Wildlife, Marine Fisheries Office.

[22] EPA-New England. 2002. Clean Water Act NPDES Permitting Determinations for Thermal Discharge and Cooling Water Intake from Brayton Point Station in Somerset, MA (NPDES Permit No. MA 0003654), July 22, 2002.

[23] Murdoch, W.W., R.C. Fay, and B.J. Mechalas. 1989. Final Report of the Marine Review Committee to the California Coastal Commission. August 1989, MRC Document No. 89-02.

nature of the SONGS discharge, which in turn supported elevated numbers of prey items for bottom-dwelling fish.

4. Missouri River

In contrast to these examples, facilities sited on waterbodies previously impaired by anthropogenic activities such as channelization demonstrate limited entrainment and impingement losses. The Neal Generating Complex facility, located near Sioux City, Iowa, on the Missouri River is coal-fired and utilizes once-through cooling systems. According to a ten-year study conducted from 1972–82, the Missouri River aquatic environment near the Neal complex was previously heavily impacted by channelization and very high flow rates meant to enhance barge traffic and navigation.[24] These anthropogenic changes to the natural river system resulted in significant losses of fish habitat. At this facility, there was found to be little impingement and entrainment by cooling water intakes.

Studies like those described in this section provide only a partial picture of the range of environmental impacts associated with cooling water intake structures. Although numerous studies were conducted to determine the environmental impacts caused by impingement and entrainment at existing facilities, many of them are based on limited data that were collected as long as 25 years ago. EPA's review of available facility impingement and

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[24] Tondreau, R., J. Hey and E. Shane, Morningside College. 1982. Missouri River Aquatic Ecology Studies: Ten Year Summary (1972–1982). Prepared for Iowa Public Service Company, Sioux City, Iowa.

entrainment studies identified a substantial number of serious study design limitations, including data collections for only one to two years or limited to one season and for a subset of the species affected by cooling water intakes; limited taxonomic detail (*i.e.*, many losses not identified to the species level); a general lack of statistical information such as inclusion of variance measures in impingement and entrainment estimates; and the lack of standard methods and metrics for quantifying impingement and entrainment, which limits the potential for evaluating cumulative impacts across multiple facilities. Further, in many cases it is likely that facility operating conditions and/or the state of the waterbody itself has changed since these studies were conducted. Finally, the methods for monitoring impingement and entrainment used in the 1970s and 1980s, when most section 316(b) evaluations were performed, were often inconsistent and incomplete, making quantification of impacts difficult in some cases. Recent advances in environmental assessment techniques **[*41589]** provide new and in some cases better tools for monitoring impingement and entrainment and quantifying the current magnitude of the impacts.[25] [26]

EPA is also concerned about the potential for cumulative impacts related to cooling water withdrawal. Cumulative impacts may result from (1)

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[25] Schmitt, R.J. and C.W. Osenberg. 1996. Detecting Ecological Impacts. Academic Press, San Diego, CA.

[26] EPRI 1999. Catalog of Assessment Methods for Evaluating the Effects of Power Plant Operations on Aquatic Communities. TR-112013, EPRI, Palo Alto, CA.

multiple facility intakes impinging and/or entraining aquatic organisms within a specific waterbody, watershed, or along the migratory pathway of specific species; (2) the existence of multiple stressors within a waterbody/watershed, including cooling water intake withdrawals; and (3) long-term occurrences of impingement and/or entrainment losses that may result in the diminishment of the compensatory reserve of a particular fishery stock.

Historically, environmental impacts related to cooling water intake structures have been evaluated on a facility-by-facility basis. These historical evaluations do not consider the potential for a fish or shellfish species to be concomitantly impacted by cooling water intake structures belonging to other facilities that are located within the same waterbody or watershed in which the species resides or along the coastal migratory route of a particular species. The potential cumulative effects of multiple intakes located within a specific waterbody or along a coastal segment are difficult to quantify and are not typically assessed. (One relevant example is provided for the Hudson River; see discussion earlier in this section.) Nonetheless, EPA analyses suggest that almost a quarter of all Phase II existing facilities are located on a waterbody with another Phase II existing facility (DCN 4-4009). Thus, EPA is concerned that although the potential for aquatic species to be affected by cooling water withdrawals from multiple facility intakes is high, this type of cumulative impact is largely unknown and has not adequately been accounted for in evaluating impacts. However, recently the Atlantic States Marine Fisheries Commission (ASMFC) was requested by its member States to investigate the cumulative impacts

on commercial fishery stocks, particularly overutilized stocks, attributable to cooling water intakes located in coastal regions of the Atlantic.[27] Specifically, the ASMFC study will evaluate the potential cumulative impacts of multiple intakes on Atlantic menhaden stock[28] which range along most of the U.S. Atlantic coast with a focus on revising existing fishery management models so that they accurately consider and account for fish losses from multiple intake structures. Results from these types of studies, although currently unavailable, will provide significant insight into the degree of impact attributable to intake withdrawals from multiple facilities.

EPA also considered information suggesting that impingement and entrainment, in conjunction with other factors, may be a nontrivial stress on a waterbody. EPA recognizes that cooling water intake structures are not the only source of human-induced stress on aquatic systems. Additional stresses to aquatic systems include, but are not limited to, nutrient, toxics, and sediment loadings; low dissolved oxygen; habitat loss; and stormwater runoff. Although EPA recognizes that a nexus between a particular stressor and adverse environmental impact may be difficult to establish with certainty, EPA believes stressors that cause or contribute to the loss of aquatic organisms and habitat such as those described above, may incrementally impact the

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[27] Personal communication, D. Hart (EPA) and L. Kline (ASMFC), 2001.

[28] Personal communication, D. Hart (EPA) and L. Kline (ASMFC), 2003.

viability of aquatic resources. EPA analyses suggest that over 99 percent of all existing facilities with cooling water withdrawal that EPA surveyed in its section 316(b) survey of existing facilities are located within two miles of waters that are identified as impaired by a State or Tribe (*see* 66 FR 65256, 65297). Thus, the Agency is concerned that to the extent that many of the aquatic organisms subject to the effects of cooling water withdrawals reside in impaired waterbodies, they are potentially more vulnerable to cumulative impacts from an array of physical and chemical anthropogenic stressors.

Finally, EPA believes that an aquatic population's potential compensatory ability—the capacity for a species to increase its survival, growth, or reproduction in response to reductions sustained to its overall population size—may be compromised by impingement and entrainment losses in conjunction with all the other stressors encountered within a population's natural range, as well as impingement and entrainment losses occurring consistently over extended periods of time. As discussed in the Phase I new facility rule (see 66 FR 65294), EPA is concerned that even if there is little evidence that cooling water intakes alone reduce a population's compensatory reserve, the multitude of stressors experienced by a species can potentially adversely affect its ability to recover.[29] Moreover, EPA notes that the opposite effect or "depensation" (decreases

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[29] Hutchings, J.A. and R.A. Myers. 1994. What can be learned from the collapse of a renewable resource? Atlantic cod, Gadus morhus, of Newfoundland and Labrador. Canadian Journal of Fisheries and Aquatic Sciences 51:2126–2146.

in recruitment as stock size declines[30]) may occur if a population's size is reduced beyond a critical threshold. Depensation can lead to further decreases in population abundances that are already seriously depleted and, in some cases, recovery of the population may not be possible even if the stressors are removed. In fact, there is some evidence that depensation may be a factor in some recent fisheries collapses.[31] [32] [33]

Another problem associated with assessing the environmental impact of cooling water intakes is that existing fishery resource baselines may be inaccurate.[34] There is much evidence that the world's fisheries are in general decline,[35] [36] however,

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[30] FN30 Goodyear, C.P. 1977. Assessing the impact of power plant mortality on the compensatory reserve of fish populations. Pages 186–195 in W. Van Winkle, ed., Proceedings of the Conference on Assessing the Effects of Power Plant Induced Mortality on Fish Populations. Pergamon Press, New York. NY.

[31] Myers, R.A., N.J. Barrowman, J.A. Hutchings, and A.A. Rosenburg. 1995. Population dynamics of exploited fish stocks at low population levels. Science 26:1106–1108.

[32] Hutchings, J.A. and R.A. Myers. 1994. What can be learned from the collapse of a renewable resource? Atlantic cod, Gadus morhus, of Newfoundland and Labrador. Canadian Journal of Fisheries and Aquatic Sciences 51:2126–2146.

[33] Liermann, M. and R. Hilborn. 1997. Depensation in fish stocks: A hierarchic Bayesian meta-analysis. Can. J. Fish. Aquatic. Sci. 54:1976–1985.

[34] Watson, R. and D. Pauly. 2001. Systematic distortions in world fisheries catch trends. Nature 414:534–536.

[35] Ibid.

many fishery stocks have not been adequately assessed. According to a 2002 study, only 23 percent of U.S. managed fish stocks have been fully assessed and of these, over 40 percent are considered depleted or are being fished beyond sustainable levels.[37] Another study estimated that more than 70 percent of commercial fish stocks are fully **[*41590]** exploited, overfished or collapsed.[38] Another estimated that large predatory fish stocks are only a tenth of what they were 50 years ago.[39] Most studies of fish populations last only a few years, do not encompass the entire life span of the species examined, and do not account for cyclical environmental changes such as ENSO events, and other long term cycles of oceanographic productivity.[40]

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[36] Pew Oceans Commission. 2003. America's Living Oceans: Charting a course for sea change. Summary Report. May 2003. Pew Oceans Commission, Arlington, VA.

[37] U.S. Commission on Ocean Policy. 2002. Developing a National Ocean Policy: Mid-Term Report of the U.S. Commission on Ocean Policy. Washington, DC

[38] Broad, W.J. and A.C. Revkin. 2003. Has the Sea Given Up its Bounty? The New York Times. July 29, 2003.

[39] Myers, R.A. and B. Worm. 2003. Rapid worldwide depletion of predatory fish communities. Nature 423: 280–283.

[40] Jackson, J.B.C., M.X. Kirby, W.H. Berger, K.A. Bjorndal, L.W. Botsford, B.J. Bourque, R.H. Bradbury, R. Cooke, J. Erlandson, J.A. Estes, T.P. Hughes, S. Kidwell, C.B. Lange, H.S. Lenihan, J.M. Pandolfi, C.H. Peterson, R.S. Steneck, M.J. Tegner, and R.R. Warner. 2001. Historical overfishing and the recent collapse of coastal ecosystems. Science 293(5530):629–638.

Although a clear and detailed picture of the status of all our fishery resources does not exist,[41] it is undisputed that fishermen are struggling to sustain their livelihood despite strict fishery management restrictions which aim to rebuild fish populations. EPA shares the concerns expressed by expert fishery scientists that historical overfishing has increased the sensitivity of aquatic ecosystems to subsequent disturbance, making them more vulnerable to other stressors, including cooling water intake structures.

In conclusion, EPA's mission includes ensuring the sustainability of communities and ecosystems. Thus, EPA must comprehensively evaluate all potential threats to resources and work towards eliminating or reducing identified threats. As discussed in this section, EPA believes that impingement and entrainment losses attributable to cooling water intakes do pose a threat to aquatic organisms and through today's rule is seeking to minimize that threat.

V. Description of the Final Rule

Clean Water Act section 316(b) requires that any standard established pursuant to section 301 or section 306 of the CWA and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Today's final rule establishes national performance

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[41] National Marine Fisheries Service (NMFS). 2002. Annual Report to Congress on the Status of U.S. Fisheries—2001. U.S. Dep. Commerce, NOAA, Natl. Mar. Fish. Serv., Silver Spring, MD, 142 pp

requirements for Phase II existing facilities that ensure such facilities fulfill the mandate of section 316(b).

This rule applies to Phase II existing facilities that use or propose to use a cooling water intake structure to withdraw water for cooling purposes from waters of the United States and that have or are required to have a National Pollutant Discharge Elimination System (NPDES) permit issued under section 402 of the CWA. Phase II existing facilities include only those facilities whose primary activity is to generate and transmit electric power and who have a design intake flow of 50 MGD or greater, and that use at least 25 percent of the water withdrawn exclusively for cooling purposes (see § 125.91). Applicability criteria for this rule are discussed in detail in section II of this preamble.

Under this final rule, EPA has established performance standards for the reduction of impingement mortality and, when appropriate, entrainment (see § 125.94). The performance standards consist of ranges of reductions in impingement mortality and/or entrainment (*e.g.*, reduce impingement mortality by 80 to 95 percent and/or entrainment by 60 to 90 percent). These performance standards reflect the best technology available for minimizing adverse environmental impacts determined on a national categorical basis. The type of performance standard applicable to a particular facility (*i.e.*, reductions in impingement only or impingement and entrainment) is based on several factors, including the facility's location (*i.e.*, source waterbody), rate of use (capacity utilization rate), and the proportion of the waterbody

withdrawn. Exhibit V-1 summarizes the performance standards based on waterbody type.

In most cases, EPA believes that these performance standards can be met using design and construction technologies or operational measures. However, under the rule, the performance standards also can be met, in whole or in part, by using restoration measures, following consideration of design and construction technologies or operational measures and provided such measures meet restoration requirements (see § 125.94(c)).

As noted earlier in this section, today's rule generally requires that impingement mortality of all life stages of fish and shellfish must be reduced by 80 to 95 percent from the calculation baseline; and for some facilities, entrainment of all life stages of fish and shellfish must be reduced by 60 to 90 percent from the calculation baseline (see § 125.94(b)).

EXHIBIT V-1.—PERFORMANCE STANDARD REQUIREMENTS

Waterbody type	Capacity utilization rate	Design intake flow	Type of performance standard
Freshwater River or Stream	Less than 15%	N/A[1]	Impingement mortality only.
	Equal to or greater than 15%	5% or less mean annual flow.	Impingement mortality only.
		Greater than 5% of mean annual flow.	Impingement mortality and entrainment.
Tidal river. Estuary or Ocean	Less than 15%	N/A	Impingement mortality only.
	Equal to or greater than 15%	N/A	Impingement mortality and entrainment.
Great Lakes	Less than 15%	N/A	Impingement mortality only.
	Equal to or greater than 15%	N/A	Impingement mortality and entrainment.

[1] Determination of appropriate compliance reductions is not applicable.

EXHIBIT V-1.—PERFORMANCE STANDARD REQUIREMENTS—Continued

Waterbody type	Capacity utilization rate	Design intake flow	Type of performance standard
Lakes or Reservoirs.....	N/A	Increase in design intake flow must not disrupt thermal stratification except where it does not adversely affect the management of fisheries.	Impingement mortality only.

[*41591] This final rule identifies five alternatives a Phase II existing facility may use to achieve compliance with the requirements for best technology available for minimizing adverse environmental impacts associated with cooling water intake structures. Four of these are based on meeting the applicable performance standards and the fifth allows the facility to request a site-specific determination of best technology available for minimizing adverse environmental impacts under certain circumstances. EPA has established these compliance alternatives for meeting the performance standards to provide a significant degree of flexibility to Phase II existing facilities, to ensure that the rule requirements are economically practicable, and to provide the ability for Phase II existing facilities to address unique site-specific factors. Application requirements vary based on the compliance alternative selected and, for some facilities, include development of a Comprehensive Demonstration Study. Application requirements are discussed later in this section. The five compliance alternatives are described in the following paragraphs.

Under § 125.94(a)(1)(i) and (ii), a Phase II existing facility may demonstrate to the Director that it has already reduced its flow commensurate with a closed-cycle recirculating system, or that it has already reduced its design intake velocity to 0.5 ft/s or less. If a facility can demonstrate to the Director that it has reduced, or will reduce, flow commensurate with a closed-cycle recirculating system, the facility is deemed to have met the performance standards to reduce impingement mortality and entrainment (see § 125.94(a)(1)(i)). Those facilities would not be required to submit a

Comprehensive Demonstration Study with their NPDES application. If the facility can demonstrate to the Director that is has reduced, or will reduce maximum through-screen design intake velocity to 0.5 ft/s or less, the facility is deemed to have met the performance standards to reduce impingement mortality only. Facilities that meet the velocity requirements would only need to submit application studies related to determining entrainment reduction, if subject to the performance standards for entrainment.

Under 21 125.94(a)(2) and (3), a Phase II existing facility may demonstrate to the Director, either that its current cooling water intake structure configuration meets the applicable performance standards, or that it has selected design and construction technologies, operational measures, and/or restoration measures that, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the specified performance standards in and/or the requirements in § 125.94(b).

Under § 125.94(a)(4), a Phase II existing facility may demonstrate to the Director that it has installed and is properly operating and maintaining a rule-specified and approved design and construction technology in accordance with § 125,99(a). Submerged cylindrical wedgewire screen technology is a rule-specified design and construction technology that may be used in instances in which a facility's cooling water intake structure is located in a freshwater river or stream and meets other criteria specified at § 125.99(a).

In addition, under this compliance alternative, a facility or other interested person may submit a request to the Director for approval of a different technology. If the Director approves the technology, it may be used by all facilities with similar site conditions under his or her jurisdiction if allowed under the State's administrative procedures. Requests for approval of a technology must be submitted to the Director and include a detailed description of the technology; a list of design criteria for the technology and site characteristics and conditions that each facility must possess in order to ensure that the technology can consistently meet the appropriate impingement mortality and entrainment performance standards in ; and information and data sufficient to demonstrate that all facilities under the jurisdiction of the Director can meet the relevant impingement mortality and entrainment performance standards in § 125.94(b) if the applicable design criteria and site characteristics and conditions are present at the facility. A Director may only approve an alternative technology following public notice and opportunity for comment on the approval of the technology (§ 125.99(b)).

Under § 125.94(a)(5)(i) or (ii), if the Director determines that a facility's costs of compliance would be significantly greater than the costs considered by the Administrator for a like facility to meet the applicable performance standards, or that the costs of compliance would be significantly greater than the benefits of meeting the applicable performance standards at the facility, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact. Under this alternative, a facility would

either compare its projected costs of compliance using a particular technology or technologies to the costs the Agency considered for a like facility in establishing the applicable performance standards, or compare its projected costs of compliance with the projected benefits at its site of meeting the applicable performance standards of today's rule (see section IX.H). If in either case costs are significantly greater, the technology selected by the Director must achieve an efficacy level that comes as close as practicable to the applicable performance standards without resulting in significantly greater costs.

During the first permit term, a facility that chooses compliance alternatives in § 125.94(a)(2), (3), (4), or (5) may request that compliance with the requirements of this rule be determined based on the implementation of a Technology Installation and Operation Plan indicating how the facility will install and ensure the efficacy, to the extent practicable, of design and construction **[*41592]** technologies and/or operational measures, and/or a Restoration Plan (§ 125.95(b)(5)). The Technology Installation and Operation Plan must be developed and submitted to the Director in accordance with § 125.95(b)(4)(ii). The Restoration Plan must be developed in accordance with § 125.95(b)(5). During subsequent permit terms, if the facility has been in compliance with the construction, operational, maintenance, monitoring, and adaptive management requirements in its TIOP and/or Restoration Plan during the preceding permit term, the facility may request that compliance during subsequent permit terms be based on its remaining in compliance with its TIOP and/or Restoration Plan, revised in accordance with

applicable adaptive management requirements if the applicable performance standards are not being met.

Three sets of data are required to be submitted 180 days prior to expiration of a facility's existing permit by all facilities regardless of compliance alternative selected (see § 122.21(r)(2)[,] (3) and (5)). These are:

- Source Water Physical Data: A narrative description and scaled drawings showing the physical configuration of all source waterbodies used by the facility, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports your determination of the waterbody type where each cooling water intake structure is located; identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and locational maps.

- Cooling Water Intake Structure Data: A narrative description of the configuration of each of its facility's cooling water intake structures and where it is located in the waterbody and in the water column; latitude and longitude in degrees, minutes, and seconds for each of its cooling water intake structures; a narrative description of the operation of each of its cooling water intake structures, including design intake flows, daily hours of operation, number of days of the year in operation, and seasonal changes, if applicable; a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges; and engineering drawings of the cooling water intake structure.

• Cooling Water System Data: A narrative description of the operation of each cooling water system, its relationship to the cooling water intake structures, proportion of the design intake flow that is used in the system, the number of days of the year the system is in operation, and seasonal changes in the operation of the system, if applicable; and engineering calculations and supporting data to support the narrative description.

In addition to the specified data facilities are require to submit, some facilities are also required to conduct a Comprehensive Demonstration Study. Specific requirements for the Comprehensive Demonstration Study vary based on the compliance alternative selected. Exhibit II summarizes the Comprehensive Demonstration Study requirements for each compliance alternative. Specific details of each Comprehensive Demonstration Study component are provided in section IX of this preamble.

EXHIBIT V-2.—SUMMARY OF COMPREHENSIVE DEMONSTRATION STUDY REQUIREMENTS FOR COMPLIANCE ALTERNATIVES

Compliance alternative (§ 125.94(b))	Comprehensive demonstration study requirements (§ 125.95(b))
1—Demonstrate facility has reduced flow commensurate with closed-cycle recirculating system	None
1—Demonstrate facility has reduced design intake velocity to ≤ 0.5 ft/s	No requirements relative to impingement mortality reduction. If subject to entrainment performance standard, the facility must only address entrainment in the applicable components of its Comprehensive Demonstration Study, based on the compliance option selected for entrainment reduction.
2—Demonstrate that existing design and Construction technologies, operational measures, and/or restoration measures meet the performance standards.	Proposal for Information Collection. Source Waterbody Flow Information. Impingement Mortality and/or Entrainment Characterization Study (as appropriate). Technology and Compliance Assessment Information —Design and Construction Technology Plan —Technology Installation and Operation Plan Restoration Plan (if appropriate). Verification Monitoring Plan.

EXHIBIT V-2.—SUMMARY OF COMPREHENSIVE DEMONSTRATION STUDY REQUIREMENTS FOR COMPLIANCE ALTERNATIVES—Continued

Compliance alternative (§ 125.94(b))	Comprehensive demonstration study requirements (§ 125.95(b))
3—Demonstrate that facility has selected design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the performance standards	Proposal for Information Collection. Source Waterbody Flow Information. Impingement Mortality and/or Entrainment Characterization Study (as appropriate). Technology and Compliance Assessment Information —Design and Construction Technology Plan —Technology Installation and Operation Plan Restoration Plan (if appropriate). Verification Monitoring Plan.
4—Demonstrate that facility has installed and properly operates and maintains an approved technology	Technology Installation and Operation Plan. Verification Monitoring Plan.

EXHIBIT V-2.—SUMMARY OF COMPREHENSIVE DEMONSTRATION STUDY REQUIREMENTS FOR COMPLIANCE ALTERNATIVES—Continued

Compliance alternative (§ 125.94(b))	Comprehensive demonstration study requirements (§ 125.95(b))
5—Demonstrate that a site-specific determination of BTA is appropriate	Proposal for Information Collection. Source Waterbody Flow Information. Impingement Mortality and/or Entrainment Characterization Study (as appropriate). Technology Installation and Operation Plan. Restoration Plan (if appropriate). Information to Support Site Specific Determination of BTA including: —Comprehensive Cost Evaluation Study (cost-cost test and cost-benefit test); —Valuation of Monetized Benefits of Reducing IM&E (cost-benefit test only); —Site-Specific Technology Plan (cost-cost test and cost-benefit test); Verification Monitoring Plan.

[*41593] The requirements in today's final rule are implemented through NPDES permits issued under section 402 of the CWA. Permit applications submitted after the effective date of the rule must fulfill rule requirements. However, facilities whose existing permit expires before [insert four years after date of publication in the FR], may request a schedule for submission of application materials that is as expeditious as practicable but does not exceed [insert three years and 180 days after date of publication in the FR], to provide sufficient time to perform the required information collection requirements. Phase II existing facilities must comply with this final rule when they become subject to an NPDES permit containing these requirements.

Finally, today's rule preserves each State's right to adopt or enforce more stringent requirements (see § 125.90(d)). It also provides that if a State demonstrates to the Administrator that it has adopted alternative regulatory requirements in its NPDES program that will result in environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under § 125,94, the Administrator must approve such alternative regulatory requirements (§ 125.90(c)).

VI. Summary of Most Significant Revisions to the Proposed Rule

A. Data Updates

Based on comments received, additional information made available, and the results of subsequent analyses, EPA revised a number of assumptions that were used in developing the

engineering costs, the information collection costs, the economic analyses, and the benefits analyses. These new assumptions are presented below and were used in the analyses in support of this final rule.

1. Number of Phase II Facilities

Since publishing the NODA, EPA continued to verify design flow information for facilities that had been classified as either Phase II (large, existing power production) or Phase III (smaller, power producing or manufacturing) facilities. This verification resulted in the following changes: One facility that was classified as a Phase II facility at proposal was reclassified as being out of scope of the section 316(b) regulation, as it ceased operating. Four facilities that were classified as Phase III facilities at proposal based on projected design intake flow were reclassified as Phase II facilities. As a result, the overall number of Phase II facilities increased from 540 to 543 facilities.[42] For the final rule, all costs, benefits, and economic analyses are based on the updated set of Phase II facilities.

The reason for the change is that the Agency revised the estimated design intake flows for

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[42] Note that these numbers are unweighted. [As with many surveys, EPA was able to obtain data from most, but not all of the facilities potentially subject to this rule. To estimate the characteristics for those facilities that were not surveyed, EPA assigned a statistically derived sample weight to those facilities for which data were collected.] On a sample-weighted basis, the number of Phase II facilities increased from 551 to 554. The number of Phase II facilities modeled by the Integrated Planning Model (IPM) increased from 531 to 535

facilities that responded to the short-technical questionnaire EPA used to collect information for this rule. The Agency has now adopted a more robust set of annual flow data (using all the years of data collected for the final rule, rather than only flows for 1998 as reported at proposal). This change altered the calculated design intake flows for the facilities that provided responses to the short-technical questionnaire that EPA used to collect data. Facilities that provided responses to the detailed questionnaire were unaffected, as the Agency collected maximum design intake flows directly through the detailed questionnaire.

2. Technology Costs

Since publishing the NODA, EPA used new information to revise the capital and operation and maintenance (O&M) costs for several compliance technologies, including those used as the primary basis for the final rule. Overall, the cost updates resulted in the following changes: total capital costs decreased by 5 percent and total operation and maintenance costs decrease by 3 percent. These comparisons are based on the raw costs, adjusted to year-2002 dollars, which have not been discounted or annualized.[43] The revised costing assumptions are discussed in detail in section VI.3.

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[43] Based on additional research conducted after NODA publication and prior to issuance of the final rule, EPA changed the projected compliance response for some facilities. These changes, together with the increase in the number of in-scope Phase II facilities, contributed to the change in total compliance costs.

3. Permitting and Monitoring Costs

Since proposal, EPA made several corrections and revisions to its burden and cost estimates for implementing the information collection requirements of today's rule, based on comments received and additional analysis. The following corrections and revisions were made since proposal:

- EPA corrected the hourly rates for the statistician and biological technician labor categories, which were inadvertently transposed at proposal.

- EPA increased the burdens associated with impingement and entrainment monitoring for the Impingement Mortality and Entrainment Characterization Study. **[*41594]**

- EPA revised the pilot study costs to assume that only a subset of facilities which are projected to install new technologies will perform pilot studies, and to be proportional to the projected capital costs for installing these new technologies in order to comply with the rule. EPA also developed an alternative national cost estimate using slightly different assumptions with regard to pilot study costs (see section XI).

- EPA adjusted the facility-level costs to account for facilities that were projected to demonstrate compliance through the installation of a wedge-wire screen in a freshwater river under the compliance alternative in 125.94(a)(4).

4. Net Installation Downtime for Non-recirculating Cooling Tower Compliance Technologies

In developing the proposal for this rule, the Agency estimated that technologies other than recirculating cooling towers would not require installation downtime for construction. However, the Agency amended this outlook for the NODA and published revised estimates of net construction downtimes for complying facilities installing a subset of technologies analyzed and developed as candidates for best technology available (BTA). Based on comments received on the NODA, the Agency has conducted further research into the construction downtimes that it used in the NODA for certain technologies. For the final regulation analysis, the Agency has adopted minor revisions to the construction downtimes for certain technologies, with the general effect being an increase in the net construction downtimes for a few technologies that the Agency views as candidates for reducing entrainment. (Net downtime was estimated by subtracting 4 weeks from total downtime, based on an assumption that facilities will schedule construction downtime during a 4 week period of normal downtime unrelated to the rule, for example, for routine maintenance.) As such, the Agency projects that a significant number of facilities expected to comply with the entrainment reduction requirements of the rule will have increased downtime costs compared to the NODA and the proposal analyses. The final costs of this rule reflect these changes, which are further discussed in Section X and the Technical Development Document.

B. Regulatory Approach, Calculation Baseline, and Measuring Compliance

1. Regulatory Approach

EPA has largely adopted the proposed rule with some restructuring and one significant change: an additional compliance alternative, the approved technology option (§ 125.94(a)(4)) which was discussed in detail in the NODA (68 FR 13539). The restructuring of the rule language now makes the reduction of flow commensurate with a closed-cycle recirculating system a separate compliance alternative, such that the rule now includes five compliance alternatives. In addition, EPA has clarified that facilities may comply with the rule requirement in section 125.94 by successfully implementing the construction, operational, maintenance, monitoring, and adaptive management requirements in a Technology Installation and Operation Plan developed in accordance with § 125.95(b)(4)(ii) and/or a Restoration Plan developed in accordance with § 125.95(b)(5). These plans must be designed and adaptively managed to meet the applicable performance standards in § 125.94(b) and (c). The following discussion describes the regulatory approach of the final rule, as developed through the proposed rule and the NODA.

EPA proposed requirements for the location, design, construction, and capacity of cooling water intakes based on the waterbody type and the volume of water withdrawn by a facility (67 FR 17122). EPA grouped waterbodies into five categories, as in the Phase I regulation—freshwater rivers and streams, lakes and reservoirs, Great Lakes, estuaries and tidal rivers, and oceans. In general, the more

sensitive or biologically productive the waterbody, the more stringent were the requirements proposed. The proposed requirements also varied based on the percentage of the source waterbody withdrawn and the capacity utilization rate.

Under the proposed rule, a facility could choose one of three compliance options: (1) Demonstrate that the facility currently meets the specified performance standards, (2) select and implement design and construction technologies, operational measures, or restoration measures that will, in combination with any existing design and construction technologies, operational measures, or restoration measures, meet the specified performance standards, and/or (3) demonstrate that the facility qualifies for a site-specific determination of best technology available, because its costs of compliance are significantly greater than those considered by EPA during the development of the proposed rule or the facility's costs of compliance would be significantly greater than the benefits of compliance with the proposed performance standards at the facility. A facility could also use restoration measures in addition to or in lieu of design and construction technologies and/or operational measures to achieve compliance under any of the compliance options.

In the NODA, EPA sought comment on a proposed fourth compliance option (68 FR 13522, 1359–41 [*sic*]). In response to comments expressing concern that the proposed Comprehensive Demonstration Study requirements (at § 125.95(b)) would impose a significant burden on permit applicants, EPA examined an additional, more streamlined compliance option under which a facility could

implement certain specified technologies that have been predetermined by EPA or the permitting authority to be highly likely to meet applicable performance standards, in exchange for not having to perform most of the elements of the proposed Comprehensive Demonstration Study.

Two variations were offered in the NODA: (1) EPA would evaluate the effectiveness of specific technologies in achieving an 80 to 95 percent reduction in impingement mortality and a 60 to 90 percent reduction in entrainment and then specify applicability criteria to ensure that the technology would meet the performance standards at facilities satisfying the criteria, or (2) EPA would establish the criteria and a process for States to pre-approve intake structure control technologies as likely to meet the performance standards. For facilities located on freshwater rivers and streams and meeting specified criteria, wedgewire screens would be expected to meet the proposed performance standards. EPA also recognized that these two variations are not mutually exclusive and either or both could be adopted in the final rule.

To a large extent, EPA is adopting the regulatory framework put forth in the proposed rule and supplemented by the NODA. To the three compliance alternatives originally proposed, EPA has added an approved technology alternative discussed in the NODA and included reduction of flow commensurate with closed-cycle cooling as a distinct alternative.

2. Calculation Baseline

Also, in response to comments that the proposed definition for the calculation baseline was overly vague, **[*41595]** EPA published in the NODA a series of additional considerations regarding the calculation baseline and a new definition of it taking these considerations into account (68 FR 13522, 13580–81). The specifications are as follows and the new definition is in today's final rule at § 125.93.

• Baseline cooling water intake structure is located at, and the screen face is parallel to, the shoreline or another depth if this would result in higher baseline impingement mortality and entrainment than the surface. EPA believes it is appropriate to allow credit in reducing impingement mortality from screen configurations that employ angling of the screen face and currents to guide organisms away from the structure before they are impinged.

• Baseline cooling water intake structure opening is located at or near the surface of the source waterbody. EPA believes it is appropriate to allow credit in reducing impingement mortality or entrainment due to placement of the opening in the water column.

• Baseline cooling water intake structure has a traveling screen with the standard 3/8 inch mesh size commonly used to keep condensers free from debris. This allows a more consistent estimation of the organisms that are considered "entrainable" vs. "impingeable" by specifying a standard mesh size that can be related to the size of the organism that may potentially come in contact with the cooling water intake structure.

• Baseline practices, procedures, and structural configurations are those that the facility would maintain in the absence of any structural or operational controls implemented in whole or in part for the purpose of reducing impingement mortality and entrainment. This recognizes and provides credit for any structural or operational controls, including flow or velocity reductions, a facility had adopted that reduce impingement mortality or entrainment.

EPA also requested comment on allowing an "as built" approach under which facilities could choose to use the existing level of impingement mortality and entrainment as the calculation baseline if they did not wish to take credit for the previously adopted measures. This could significantly simplify the monitoring and calculations necessary to determine the baseline.

In the NODA, EPA also discussed an approach to compliance under which facilities would have an "optimization period" during which they would not be required to meet performance standards but, rather, would install, operate and maintain the selected control technologies to minimize impingement mortality and entrainment. EPA suggested several possible durations for this optimization period, and also requested comment on not specifying the duration, but instead leaving it up to the Director. 68 FR 12586 (March 19, 2003).

For the final rule, EPA adopted the NODA definition of calculation baseline with some modifications. More specifically, EPA clarified the calculation baseline to include consideration of intake depth other than at or near the surface in

determining the baseline. EPA also adopted the "as built" approach for the calculation baseline, which allows facilities to use current levels of impingement mortality and entrainment as the calculation baseline if the facility is configured similarly to the criteria set up for the calculation baseline.

Finally, EPA clarified how compliance with the requirements in § 125.94 should be determined. In particular, the final rule provides that compliance during the first permit term (and subsequent permit terms if specified conditions are met) may be determined based on compliance with the construction, operational, maintenance, monitoring, and adaptive management requirements in an approved Technology Installation and Operation Plan and/ or an approved Restoration Plan, that has been developed in accordance with specified requirements to meet the applicable performance standards.

3. Measuring Compliance

EPA has clarified how compliance will be measured. At proposal, EPA received comment from the industry that there were uncertainties associated with how compliance with the proposed requirements, particularly the numeric impingement mortality and entrainment performance standards, would be determined. Under the proposed rule and NODA, determining compliance, while obviously dependent on the compliance alternative selected, would, in general, require the development of waterbody characterization data, including key criteria (species, parameters, etc.) to be measured and monitored; a determination of baseline environmental impacts; implementation of cooling

water intake technologies (assuming the facility does not already meet applicable performance standards and pursues this alternative); monitoring the selected criteria; and an evaluation of compliance with the applicable numeric impingement mortality and/or entrainment permit standard. The industry stakeholders were concerned that using the performance standard to set enforceable performance requirements would require facilities to collect and analyze greater amounts of data than EPA projected to be able to account for the variability inherent in biological and efficacy data needed to support compliance determinations in spite of overall good technology performance. These stakeholders stated that setting enforceable performance standards would lead to greater administrative burdens and delays when determining numeric standards and monitoring requirements to determine compliance. They were also concerned that establishing numeric standards would stifle innovation because of fears that a technology would not perform as anticipated. These stakeholders suggested that the performance standards in the rule serve as a consistent basis for setting permit conditions and for identifying technologies; installing, operating, and maintaining the chosen technology; performing compliance monitoring; and refining or adjusting operation, maintenance, or other factors in light of initial monitoring.

Today's rule allows facilities to develop and implement a Technology Installation and Operation Plan that would, when used, serve as the primary mechanism upon which compliance with the performance standard requirements of this rule is determined. EPA has established this compliance

mechanism because it will ensure that Phase II existing facilities will continually be required to achieve a level of performance that constitutes, for them, best technology available for minimizing adverse environmental impact. For facilities that choose to comply with applicable requirements in whole or in part through the use of restoration measures, the Restoration Plan would serve a similar function. The Restoration Plan is discussed in detail in section IX.

An existing facility that chooses to use a Technology Installation and Operation Plan must (1) select design and construction technologies, operational measures, and/or restoration measures that will meet the performance standards, and (2) prepare a Technology Installation and Operation Plan documenting what, how and when it will install, operate, maintain, monitor, assess, and adaptively manage the design and construction technologies and operational measures to meet the performance standards, including operational parameters and **[*41596]** inspection schedules, etc. Each facility using a Technology Installation Operation Plan must specify key parameters regarding monitoring (*e.g.*, parameters to be monitored, location, and frequency), optimization activities and schedules for undertaking them, ways of assessing efficacy (including adaptive management plan for revising design and construction technologies or operational measures) that ensure that such technologies and measures are effectively implemented, and revised as needed to meet performance standards. This plan must be reviewed and approved by the Director and evaluated for sufficiency and/or revised at each

permit term to ensure that the facility is moving expeditiously toward attainment of the applicable performance standards. Once approved, each Phase II existing facility must implement the plan according to its terms. Compliance with the final rule's performance standards during the permit term will be assessed based on the terms of the plan. If a facility does not comply with the plan, the Director has discretion to implement the performance standards or requirements through specifying numeric impingement mortality and entrainment requirements or technology prescription (for the site-specific alternative) in the permit. In addition, a facility that is unable to meet the applicable performance standards using the Technology Installation and Operation Plan approach may request in a subsequent permit that the Director make a site-specific determination of best technology available in accordance with § 125.94(a)(5).

Under these provisions, compliance is determined in terms of whether the facility is implementing, in accordance with the Technology Installation and Operation Plan schedule, the technologies, measures and practices determined by the Director to be the best technologies available for minimizing adverse environmental impact for that facility. The Section 316(b) requirements for the facility are expressed non-numerically, which is analogous to the use of best management practices under other provisions of the CWA. See, *e.g.*, sections 402(a) and 402(p). While EPA has been able to calculate ranges for national performance standards based on model technologies, EPA has insufficient data to determine—as it routinely can do in the context of effluent limitations guidelines and standards—that

use of those model technologies will consistently result in achievement of those standards.

The record persuades EPA that there is uncertainty associated with the application and long-term efficacy of these technologies at all facilities under the multitude of different site-specific factors and conditions under which these technologies might have to perform. In addition, even at a single site, there is substantial year-to-year variability in species abundance and composition, as well as other natural and anthropogenic factors, that may affect the performance of a particular technology installed at the facility and it is unclear how this would affect the efficacy of the technology. The Technology Installation and Operation Plan provisions are intended to account for this. For example, meeting numerical reduction standards may not be possible at some sites either because hydrological conditions are not conducive to technological effectiveness, or due to species sensitivity. A Technology Installation and Operation Plan allows a facility, working with the Director, to identify, install, and adaptively manage technologies suited to its particular site conditions. In addition, measuring impingement mortality and entrainment reduction is difficult and would require a substantial amount of multi-year biological data and analysis is burdensome for the facility to develop, is often well beyond the type of information EPA can expect State Directors to be able to develop when monitoring compliance. A Technology Installation and Operation Plan simplifies enforcement: if a facility fails to meet the schedules and other terms of its plan, it is violating its section 316(b) requirements; there is no need to engage in extensive debate about the meaning of

complex biological data. This does not mean that biological monitoring and assessment of success in meeting applicable performance standards is not important. If fact, it is critical to the compliance approach adopted in the rule in that it informs facilities and permit authorities when adaptive management, including revisions to the Technology Installation and Operation Plan, are needed to meet the performance standards.

The Technology Installation and Operation Plan provisions also reflect that there is uncertainty about how long it would take a facility to adaptively manage the technology and determine the appropriate operating conditions for the technology to meet the applicable performance requirements. Data and comments available to EPA suggest that it is common for existing facilities to adjust technologies over time in order to achieve optimum performance and, therefore, an adaptive management approach as specified under a plan is appropriate. See documentation at DCN# 1-3019-BE, 4-1830, and 6-5001. EPA understands that adaptive management is going to be necessary for a number of facilities because there are relatively few rigorous evaluations of efficacy under different site and operating conditions. The available studies may also be limited in the numbers and types of species that they have evaluated and they may not show the long term demonstrated effectiveness (and/or consistency of effectiveness) of the technology with the added uncertainties associated with the variability of natural biological systems. By requiring facilities to employ adaptive management principles, EPA assures that the facility will be

implementing, on an ongoing basis, the best array of technologies available to them.

As noted above, the Technology Installation and Operation Plan provisions also simplify implementation because they identify the specific compliance requirements needed to meet the performance standard ranges and reduce some of the burden associated with measuring and enforcing compliance with these ranges for both existing facilities and Directors. Directors and facilities may find use of a Technology Installation and Operation Plan preferable because it is less feasible to develop and accurately evaluate biological monitoring data over a relatively short period, as would be required by measuring compliance against a numeric performance standard. Rather, the plan provisions allow implementation to be adaptive, and allow for data development and assessment to proceed in a manner that is appropriate for the facility, technology, and waterbody characteristics.

EPA has the legal authority to express section 316(b) requirements in terms of design criteria, in addition to or in place of enforceable numeric performance standards. EPA employed a design criterion approach in the Phase I rule, when EPA was able to identify a single nationally available and economically practicable technology for the category of new facilities as a whole, in that case closed-cycle recirculating cooling technology. In this rule, EPA was not able to identify a uniform set of technologies that would be available and economically practicable for all existing facilities, but EPA was able to articulate a uniform nationally applicable principle in the form of the performance standards in

§ 125.94(b), by **[*41597]** which such technologies could be identified by the Director and implemented through the use of a Technology Installation and Operation Plan designed to achieve them. While the technology solution was different in Phase I and Phase II, the legal principle is the same. In addition, EPA has the legal authority to identify section 316(b) requirements as an evolving set of technologies, rather than a single technology array fixed in time. Section 316(b) requires that any technology selected under that section must be the best available to the facility. This term encompasses consideration of effectiveness, costs, non-water quality environmental impacts, feasibility issues and a host of other considerations relevant to existing facilities. See section 304(b)(2)(B). The record indicates that for some facilities, the question of what are available technologies and, among those, what is the best technology, may change over time. A Technology Installation and Operation Plan is intended to assure that at all times a facility is implementing a technology—or a technology plan—that reflects the best of all technologies consistent with uniform guiding principles in the form of performance standards available to them in light of their site-specific circumstances.

Finally, EPA notes that the way in which performance standards guide technology selection and implementation varies slightly among the five compliance options. For facilities complying with § 125.94(a)(1), the technologies identified are so effective that EPA is confident that any facility employing them will meet the performance standards, so a Technology Installation and Operation Plan and performance monitoring are not

required. Because these technologies are not available to all Phase II existing facilities, however, EPA has provided alternative compliance options. For facilities complying in accordance with § 125.94(a)(2), (3), or (4), compliance is generally achieved by implementation of a Technology Installation and Operation Plan designed to meet applicable performance standards. Finally, for facilities that comply in accordance with § 125.94(a)(5) for whom even compliance in accordance with § 125.94(a)(2), (3), or (4) is not available because of significantly higher costs, compliance is achieved by implementation of a Technology Installation and Operation Plan that achieves an efficacy as close as practicable to the applicable performance standards.

4. Site-Specific Requirements

a. Costs Significantly Greater Than Costs Considered by the Administrator

In today's final rule, a facility that demonstrates to the Director that the costs of compliance with the performance standards and/or restoration requirements would be significantly greater than the costs considered by the Administrator for a similar facility, will be given a site-specific determination of best technology available for minimizing adverse environmental impact. The standards of the rule have not changed since proposal, with the exception of one clarification: in the final rule, the alternative site-specific requirements established by the Director must achieve an efficacy that is as close as practicable to the performance standards and/or restoration requirements specified in § 125.94(b) and (c). This was not specified in the proposed rule

language. In addition, today's final rule also explains how a facility should calculate costs considered by the Administrator for a similar facility, for comparison with the costs of compliance for the facility. EPA details these steps in § 125.94(a)(5)(i)(A)–(F).

In the proposed rule, submittal requirements for facilities requesting a variance based upon a cost-cost test were identical to those for facilities requesting a variance based on a cost-benefit test. Thus, a facility requesting a site-specific determination based on a cost-cost comparison had to submit three studies: the Cost Evaluation Study, the Valuation of Monetized Benefits of Reducing Impingement and Entrainment, and the Site-Specific Technology Plan. In the final rule, by contrast, a facility must submit only the Cost Evaluation Study and the Site-Specific Technology Plan.

Under the Comprehensive Cost Evaluation Study detailed at proposal, a facility must submit detailed engineering cost estimates to document the costs of implementing the technologies and/or operational measures in the facility's Design and Construction Plan. In the final rule, the facility must provide, in addition to the engineering cost estimates, a demonstration that the costs significantly exceed the benefits of complying with the applicable performance standards. EPA did not make significant changes to the requirements under the Site-Specific Technology Plan.

In summary, the major changes in the cost-cost analysis are as follows:

• In the final rule, EPA has specified how a facility must "calculate costs considered by the Administrator" for comparison with the facility's estimate of the costs of compliance with the final rule,

• Elimination of the requirement to submit a Valuation of Monetized Benefits of Reducing Impingement and Entrainment, and

• Addition of the requirement to demonstrate that the costs significantly exceed the costs considered by the Administrator for a similar facility, under the Cost Evaluation Study.

b. Costs Significantly Greater Than Benefits

In today's final rule, a facility that demonstrates to the Director that the costs of compliance with the performance standards and/or restoration requirements would be significantly greater than the benefits will be given a site-specific determination of best technology available for minimizing adverse environmental impact. The standards of the rule have not changed since proposal, with the exception of one clarification: in the final rule, the alternative site-specific requirements established by the Director must achieve an efficacy that is as close as practicable to the performance standards and/or restoration requirements specified in § 125.94(b) and (c). This was not specified in the proposed rule language.

In the final rule, as in the proposal, a facility requesting a site-specific determination based on a cost-benefit comparison must submit three studies: the Cost Evaluation Study, the Benefits Valuation Study (referred to in proposal as Valuation of

Monetized Benefits of Reducing Impingement and Entrainment), and the Site-Specific Technology Plan. The final rule has both added and clarified requirements for the first two components relative to the proposal, but has provided no substantive changes in the requirements for the Site-Specific Technology Plan.

Under the Comprehensive Cost Evaluation Study detailed at proposal, a facility must submit detailed engineering cost estimates to document the costs of implementing the technologies and/or operational measures in the facility's Design and Construction Plan. In the final rule, the facility must provide, in addition to the engineering cost estimates, a demonstration that the costs significantly exceed the benefits of complying with the applicable performance standards.

Additional clarifications are found in the Benefits Valuation Study. In the proposed rule, a facility was required to submit (1) a description of the **[*41598]** methodology used to estimate the benefits' value, (2) the basis for assumptions and quantitative estimates, and (3) an uncertainty analysis. In the final rule, EPA has retained the three submittal requirements. Under the first component, EPA has specified the categories of potential valuation estimates in the final rule, namely commercial, recreational and ecological benefits. EPA has added that a facility should include non-use benefits if applicable. To the second component, EPA has added that the basis may include a determination of entrainment survival if the Director approved such a study. Requirements for the uncertainty analysis remain unchanged from proposal. In the final rule,

EPA has added that a facility will be required to submit peer review of the items submitted (upon the Director's request) and a narrative description of non-monetized benefits that would result at the site if the facility was to meet applicable performance standards.

In summary, the major changes in the cost-benefit analysis are as follows:

- Facilities will be required to achieve an efficacy that is "as close as practicable" to performance standards and/ or restoration requirements,

- Facilities will need to specifically demonstrate that costs are significantly greater than the benefits of compliance, and

- Facilities will have additional requirements under the Benefits Valuation Study.

VII. Basis for the Final Regulation

A. Why Is EPA Establishing a Multiple Compliance Alternative Approach for Determining Best Technology Available for Minimizing Adverse Environmental Impact?

Today's final rule authorizes a Phase II existing facility to choose one of five alternatives for establishing the best technology available for minimizing adverse environmental impacts at the facility. A facility may (1) demonstrate that it has reduced or will reduce its cooling water intake flow commensurate with a closed-cycle, recirculating system, and or that it has reduced, or will reduce, the maximum through-screen design intake velocity to 0.5 ft/s or less; (2) demonstrate that its existing design and construction technologies, operational

measures, and/or restoration measures meet the applicable performance standards and restoration requirements; (3) demonstrate that it has selected design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the applicable performance standards and restoration requirements; (4) demonstrate that it will install or has installed and properly operates and maintains an approved design and construction technology; or (5) demonstrate that it has selected, installed, and is properly operating and maintaining, or will install and properly operate and maintain, design and construction technologies, operational measures, and/or restoration measures that the Director has determined to be the best technology available for the facility based on application of a specified cost-to-cost test or a cost-to-benefit test. The basis for each of the five compliance alternatives is explained in section VII.C. of this preamble.

The rule establishes performance standards for the reduction of impingement mortality and entrainment. EPA established these performance standards in part based on a variety of technologies, but the rule does not mandate the use of any specific technology. These performance standards vary by waterbody type (*i.e.*, freshwater river/stream, estuary/tidal river, ocean, Great Lake, or lake/reservoir) and the capacity utilization rate of the facility. They may be met in whole or in part using restoration measures after demonstrating, among other things, that the facility has evaluated the use of design and construction technologies and

operational measures at the site. The basis for the performance standards is explained in section VII.B. of this preamble and the basis for the restoration requirements is explained at section VII.F. of this preamble. For a more detailed description of the rule, see sections V and IX of this preamble. These requirements reflect the best technology available for minimizing adverse environmental impact from cooling water intake structures.

EPA adopted this regulatory scheme because it provides a high degree of flexibility for existing facilities to select the most effective and efficient approach and technologies for minimizing adverse environmental impact associated with their cooling water intake structures. This approach also reflects EPA's judgment that, given the wide range of various factors that affect the environmental impact posed by Phase II existing facilities, different technologies or different combinations of technologies can be used and optimized to achieve the performance standards.

B. Why and How Did EPA Establish the Performance Standards at These Levels?

1. Overview of Performance Standards

The final rule establishes two types of performance standards, one that addresses impingement mortality and one that addresses entrainment. EPA used impingement mortality and entrainment as a metric for performance because these are primary and distinct types of harmful impacts associated with the use of cooling water intake structures (*see also* section IV). Both the impingement mortality and the entrainment performance standards apply to facilities demonstrating compliance under

alternatives two, three, and four, described above (§ 125.94(a)(2), (3), and (4)). In addition, the Director's site-specific alternative requirements must be as close as practicable to the applicable performance standards under § 125.94. Performance standards for entrainment do not apply to facilities with low utilization capacity, those with a design intake flow of five percent or less of the mean annual flow of a freshwater river or stream, and those that withdraw cooling water from a lake (other than one of the Great Lakes) or reservoir because such facilities have a low propensity for causing significant entrainment impacts due to limited facility operation, low intake flow, or general waterbody characteristics. The impingement mortality performance standard requires a Phase II existing facility that complies under (§ 125.94(a)(2), (3), and (4), and to reduce impingement mortality of all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline.

Both an entrainment performance standard and an impingement mortality standard apply to facilities with a capacity utilization rate of 15 percent or greater and that withdraw cooling water from a tidal river, estuary, ocean, one of the Great Lakes, as well as facilities that use cooling water from a freshwater river or stream and the design intake flow of the cooling water intake structure is greater than five percent of the mean annual flow because EPA believes that these facilities cause more significant entrainment impacts. The entrainment standard, where applicable, requires a Phase II facility to reduce entrainment of all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline.

2. Basis for Performance Standards

Overall, the performance standards that reflect best technology available under today's final rule are not based on a single technology but, rather, are **[*41599]** based on consideration of a range of technologies that EPA has determined to be commercially available for the industries affected as a whole and have acceptable non-water quality environmental impacts, except for some potential regional energy (reliability) impacts that will be minimized to the extent possible through flexible compliance options. Because the requirements implementing section 316(b) are applied in a variety of settings and to Phase II existing facilities of different types and sizes, no single technology is most effective at all existing facilities, and a range of available technologies has been used to derive the performance standards.

EPA developed the performance standards for impingement mortality reduction based on an analysis of the efficacy of the following technologies: (1) Design and construction technologies such as fine and wide-mesh wedgewire screens, as well as aquatic filter barrier systems, that can reduce mortality from impingement by up to 99 percent or greater compared with conventional once-through systems; (2) barrier nets that may achieve reductions of 80 to 90 percent; and (3) modified screens and fish return systems, fish diversion systems, and fine mesh traveling screens and fish return systems that have achieved reductions in impingement mortality ranging from 60 to 90 percent as compared to conventional once-through systems.

Available performance data for entrainment reduction are not as comprehensive as impingement data. However, aquatic filter barrier systems, fine mesh wedgewire screens, and fine mesh traveling screens with fish return systems have been shown to achieve 80 to 90 percent or greater reduction in entrainment compared with conventional once-through systems. EPA notes that screening to prevent organism entrainment may cause impingement of those organisms instead.

3. Discussion of Key Aspects of Performance Standards

The performance standards at § 125.94(b)(1), (2) and (3) are based on the type of waterbody in which the intake structure is located, the volume of water withdrawn by a facility, and the facility capacity utilization rate. Under the final rule, EPA has grouped waterbodies into five categories: (1) Freshwater rivers or streams, (2) lakes or reservoirs, (3) Great Lakes, (4) tidal rivers and estuaries, and (5) oceans. The Agency considers location, one aspect of which is waterbody type, to be an important factor in addressing adverse environmental impact caused by cooling water intake structures. Because different waterbody types have the potential for different adverse environmental impacts, the requirements to minimize adverse environmental impact vary by waterbody type.

The reproductive strategies of tidal river and estuarine species, together with other physical and biological characteristics of those waters, make them more susceptible than other waterbodies to impacts from cooling water intake structures (66 FR 288857–288859; 68 FR 17140). In contrast, many aquatic

organisms found in non-tidal freshwater rivers and streams are less susceptible to entrainment due to their demersal (bottom-dwelling) nature and the fact that they do not typically have planktonic (free-floating) egg and larval stages (66 FR 288857; 68 FR 17140). Comments on the proposed Phase II existing facility rule also acknowledge that waterbody type is an important factor in assessing the impacts of cooling water intake structures, although some commenters preferred a site-specific approach, and others maintained that all waters deserve the most rigorous technology. A number of States supported EPA's proposed approach.

Absent entrainment control technologies, entrainment at a particular site is generally proportional to intake flow at that site. As discussed above, EPA believes it is reasonable to vary performance standards by the potential for adverse environmental impact in a waterbody type. EPA is limiting the requirement for entrainment controls in fresh waters to those facilities that withdraw the largest proportion of water from freshwater rivers or streams because they have the potential to impinge and entrain larger numbers of fish and shellfish and therefore have a greater potential to cause adverse environmental impact. EPA is not requiring entrainment reductions in freshwater rivers or streams where facilities withdraw 5 percent or less of the source water annual mean flow because such facilities generally have a low propensity for causing significant entrainment impacts due to the low proportion of intake flow in combination with the characteristics of the waterbody.

There are additional performance standards for facilities withdrawing from a lake (other than one of the Great Lakes) or a reservoir. If such a facility proposes to increase the design intake flow of the cooling water intake structure, the increase in total design intake flow must not disrupt the natural thermal stratification or turnover pattern of the source water except in cases where the disruption does not adversely affect the management of fisheries § 125.94(b)(3)(iii)). The natural thermal stratification or turnover pattern of a lake is a key characteristic that is potentially affected by the intake flow (which can alter temperature and/or mixing of cold and warm water layers) and location of cooling water intake structures within such waterbodies. Cooling water intake structures withdrawing from the Great Lakes are required to reduce fish and shellfish impingement mortality by 80 to 95 percent and to reduce entrainment by 60 to 90 percent. As described in the Phase I proposed rule (65 FR 49086) and NODA (66 FR 28858), EPA believes that the Great Lakes are a unique system that should be protected to a greater extent than other lakes and reservoirs. Similar to oceans, large lakes such as the Great Lakes can possess estuarine-like environments in the lower reaches of tributary streams. For example, within the U.S., a total of 1,370 distinct coastal wetlands fringe the Great Lakes and the channels that connect the lakes. (2-016A Herdendorf, C.E. Great Lakes estuaries. Estuaries, 13(4): 493–503. 1990, pg. 493). The Agency is therefore specifying entrainment controls as well as impingement mortality controls for the Great Lakes. EPA has not applied the entrainment performance standard to lakes other than the Great

Lakes because, in general, these waterbodies contain aquatic organisms that tend to be less impacted by entrainment than organisms in estuaries or fresh water rivers or streams.

The performance standards for facilities with cooling water intake structures located in a tidal river or estuary and with a capacity utilization rate of 15 percent or greater are to reduce impingement mortality by 80 to 95 percent and entrainment by 60 to 90 percent for fish and shellfish. As discussed previously, EPA believes estuaries and tidal rivers are more susceptible than other waterbodies to adverse impacts from impingement and entrainment.

The performance standards for facilities with cooling water intake structures located in an ocean are to reduce impingement mortality by 80 to 95 percent and entrainment by 60 to 90 percent for fish and shellfish. EPA is establishing requirements for facilities withdrawing from oceans that are similar to those for tidal rivers and estuaries because the coastal zone of oceans (from which coastal cooling water intake structures withdraw water) **[*41600]** are highly productive areas for fish and shellfish. (*See* the Phase I proposed rule (65 FR 45060) and documents in the record for the Phase I new facility rule (Docket # W-00-03) such as 2-013A through O, 2-019A-R11, 2-019A-R12, 2-019A-R33, 2-019A-R44, 2-020A, 3-0059). EPA is also concerned about the extent to which fishery stocks that rely upon tidal rivers, estuaries and oceans for habitat are overutilized and seeks to minimize the impact that cooling water intake structures may have on these species or forage species on which these fishery

stocks may depend. Recent data demonstrate that approximately 78% of the fish stocks managed by the National Oceanic and Atmospheric Administration's National Marine Fishery Service (NMFS) are fully exploited, overfished, or collapsed (America's Living Oceans: Charting a Course for Sea Change, Pew Oceans Commission, June 4, 2003). (*See also* documents 2-019A-R11, 2-019A-R12, 2-019A-R33, 2-019A-R44, 2-020A, 2-024A through O, and 3-0059 through 3-0063 in the record of the Final New Facility Rule (66 FR 65256), Docket # W-00-03).

In accordance with the Phase II rule, facilities that operate with a capacity utilization rate of less than 15 percent are subject to the performance standard for impingement mortality only. EPA is not requiring, in today's rule, that these facilities control entrainment. EPA has several reasons for this. First, EPA has determined that entrainment control technology is not economically practicable in view of the reduced operating levels of these facilities. These facilities also tend to operate most often in mid-winter or late summer, which are times of peak energy demand but periods of generally low abundance of entrainable life stages of fish and shellfish. Finally, the total volume of water withdrawn by these facilities is significantly lower than for facilities operating at or near peak capacity, and as noted above, entrainment at a site is generally proportional to flow, absent entrainment controls. Consequently, EPA determined that it was neither necessary nor cost-effective for these facilities to reduce entrainment where the total volume of water withdrawn and the number of organisms that would be protected from entrainment is likely to be small. EPA is also allowing facilities

with multiple, distinct cooling water intakes that are exclusively dedicated to different generating units to determine capacity utilization and applicable performance standards separately for each intake for the same reasons.

As in the Phase I rule, EPA is setting performance standards for minimizing adverse environmental impact based on a relatively easy to measure and certain metric—reduction of impingement mortality and entrainment. Although adverse environmental impact associated with cooling water intake structures can extend beyond impingement and entrainment, EPA has chosen this approach because impingement and entrainment are primary, harmful environmental effects that can be reduced through the use of specific technologies. In addition, where other impacts at the population, community, and ecosystem levels exist, these will also be reduced by reducing impingement and mortality. Using impingement mortality and entrainment as a metric provides certainty about performance standards and streamlines, and thus speeds, the issuance of permits.

EPA is expressing the performance standard in the form of ranges rather than a single performance benchmark because of the uncertainty inherent in predicting the efficacy of any one of these technologies, or a combination of these technologies, across the spectrum of facilities subject to today's rule. The lower end of the range is being established as the percent reduction that EPA, based on the available efficacy data, expects all facilities could eventually achieve if they were to implement and optimize available design and construction

technologies and operational measures on which the performance standards are based. (*See* Chapter 4, "Efficacy of Cooling Water Intake Structure Technologies," of the Phase II Existing Facility Technical Development Document, EPA-821-R-04-007, February 2004. Also, *see* EPA's 316(b) technology efficacy database, DCN 6-5000.) The lower end of the range also reflects, in part, higher mortality rates at sites where there may be more fragile species that may not have a high survival rate after coming in contact with fish protection technologies at the cooling water intake structure (*e.g.*, fine mesh screens). The higher end of the range is a percent reduction that available data show many facilities can and have achieved with the available technologies upon which the performance standards are based.

In specifying a range, EPA anticipates that facilities will select the most cost-effective technologies or operational measures to achieve the performance level (within the stated range) based on conditions found at their site, and that Directors will review the facility's application to ensure that appropriate alternatives were considered. Proper selection, operation, and maintenance of these technologies would serve to increase potential efficiencies of the technologies. EPA also expects that some facilities may be able to meet these performance requirements by selecting and implementing a suite (*i.e.*, more than one) of technologies and operational measures and/or, as discussed in this section, by undertaking restoration measures.

Several additional factors support EPA's expectation that the impingement mortality and entrainment reduction reflected in the performance standards can eventually be achieved by all facilities using the design and construction technologies and measures on which the standards were based. First, a significant portion of the available performance data reviewed is from the 1970s and 1980s (when section 316(b) was initially implemented) and does not reflect recent developments, innovations (*e.g.*, aquatic filter barrier systems, sound barriers), or experience using these technologies. These data, developed during early implementation of the CWA, do not fully reflect today's improved understanding of both how the various control technologies work and the various factors that reflect what constitutes and how to measure healthy aquatic conditions. Second, these conventional barrier and return system technologies have not been optimized on a widespread level to date, as would be encouraged by this rule. Available information indicates that facilities that use these cooling water intake structure technologies often achieve better results from the technologies through adjusting which technologies are applied and how they are used. Such optimization, which also benefits from the advances in understanding noted above, would be promoted under this rule as facilities work to achieve the performance standards. Third, EPA believes that some facilities could achieve further reductions (estimated at 15–30 percent) in impingement mortality and entrainment by providing for seasonal flow restrictions, variable speed pumps, systems conversions to closed-cycle, recirculating systems, and other operational measures and innovative flow

reduction alternatives. Such operational measures could be used to supplement design and construction technologies where necessary to meet the performance standards. Facilities also could benefit from combining inexpensive technologies as a "suite." For additional discussion, see chapter 4 in the Phase II Existing Facility Technical Development Document.

The calculation baseline used to determine compliance with **[*41601]** performance standards is defined in § 125.93 as an estimate of impingement mortality and entrainment that would occur at a site assuming (1) the cooling water system had been designed as a once-through system; (2) the opening of the cooling water intake structure is located at, and the face of the standard 3/8-inch mesh traveling screen is oriented parallel to, the shoreline near the surface of the source waterbody; and (3) the baseline practices and procedures are those that the facility would maintain in the absence of any operational controls, including flow or velocity reductions, implemented in whole or in part for the purposes of reducing impingement mortality and entrainment. In addition, the facility may choose to use the current level of impingement mortality and entrainment as the calculation baseline. EPA's definition also clarifies the range of available information sources for the baseline. The calculation baseline may be estimated using: historical impingement mortality and entrainment data from the facility or from another facility with comparable design, operational, and environmental conditions; current biological data collected in the waterbody in the vicinity of the facility's cooling water intake structure; or current impingement mortality and

entrainment data collected at the facility. Further, a facility may request that the calculation baseline be modified to be based on a location of the opening of the cooling water intake structure at a depth other than at or near the surface if it can demonstrate to the Director that the other depth would correspond to a higher baseline level of impingement mortality and/or entrainment. EPA decided to use this definition because it represents the most common default conditions the Agency could identify to give facilities credit for design and construction technologies, operational measures, and/or restoration measures that they have already implemented to minimize adverse environmental impact, while providing a clear and relatively simple definition. Based on comments received on the Phase II NODA, this calculation baseline definition includes additional criteria that EPA has added to provide clarity to the analysis. (Proposed changes to the calculation baseline were discussed in the Phase II NODA, see 68 FR 13580). In many cases, existing technologies at the site show some reduction in impingement and entrainment when compared to this baseline. In such cases, impingement mortality and entrainment reductions (relative to the calculated baseline) achieved by these existing technologies should be counted toward compliance with the performance standards. In addition, operational measures such as operation of traveling screens, employment of more efficient return systems, and even locational choices should be credited for any corresponding reduction in impingement mortality and entrainment. See section IX of this preamble for a discussion of how

the calculation baseline is used to compare facility performance with the rule's performance standards.

C. What Is the Basis for the Five Compliance Alternatives That EPA Selected for Establishing Best Technology Available?

1. Meeting Performance Standards Through Reducing Intake Flow Commensurate With a Closed Cycle Recirculating System or Reduced Design Intake Velocity

Under § 125.94(a)(1)(i), any facility that reduces its flow to a level commensurate with a closed-cycle, recirculating cooling system meets the performance standards in today's rule because such a reduction in flow is deemed to satisfy any applicable impingement mortality and entrainment performance standards for all waterbodies. Facilities that select this compliance alternative either through the use of closed-cycle recirculating system technology at the plant, or by retrofitting their facility, will not be required to further demonstrate that they meet the applicable performance standards. Similarly, under § 125.94(a)(1)(ii), any facility that reduces its design intake velocity to 0.5 ft/s or less is deemed to have met the performance standards for impingement mortality and is not required to demonstrate further that it meets the performance standards for impingement mortality.

Available data described in Chapter 3 of the Phase II Existing Facility Technical Development Document suggest that closed-cycle, recirculating cooling systems (*e.g.*, cooling towers or ponds) can reduce mortality from impingement by up to 98 percent and entrainment by up to 98 percent when

compared with conventional once-through systems.[44] Although closed-cycle, recirculating cooling is not one of the technologies on which the performance standards are based, use of a closed-cycle, recirculating cooling system would always achieve the performance standards and therefore, facilities that reduce their flow commensurate with closed-cycle, recirculating cooling systems are deemed to have met performance standards. The rule, at § 124.94(a)(1)(i), thus establishes a compliance alternative based on the use of a closed-cycle, recirculating cooling system. While EPA based the requirements of the new facility rule on the performance standards of closed-cycle recirculating systems, EPA has determined that this technology is not economically practicable for many existing Phase II facilities. EPA is nonetheless aware that some existing facilities have installed this highly effective technology and has thus provided a streamlined alternative for such facilities.

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[44] Reducing the cooling water intake structure's capacity is one of the most effective means of reducing entrainment (and impingement). For the traditional steam electric utility industry, facilities located in freshwater areas that have closed-cycle recirculating cooling water systems can, depending on the quality of the make-up water, reduce water use by 96 to 98 percent from the amount they would use if they had once-through cooling water systems. Steam electric generating facilities that have closed-cycle, recirculating cooling systems using salt water can reduce water usage by 70 to 96 percent when make-up and blowdown flows are minimized. The lower range of water usage would be expected where State water quality standards limit chloride to a maximum increase of 10 percent over background and therefore require a 1.1 cycle of concentration. The higher range should be attainable where cycles of concentration up to 2.0 are used for the design.

Additionally, EPA established a compliance alternative that allows facilities to reduce intake velocity to meet the impingement mortality performance standards. As EPA discussed in the proposed rule at 67 FR 17151 and Phase I final rule at 66 FR 65274, intake velocity is one of the key factors that can affect the impingement of fish and other aquatic biota, since in the immediate area of the intake it exerts a direct physical force against which fish and other organisms must act to avoid impingement and entrainment. As discussed in that notice, EPA compiled data from three swim speed studies (University of Washington study, Turnpenny, and EPRI) and these data indicated that a 0.5 ft/s velocity would protect at least 96 percent of the tested fish. As further discussed, EPA also identified federal documents (Boreman, DCN 1-5003-PR; Bell (1990); and National Marine Fisheries Service (NMFS), (1997)), an early swim speed and endurance study performed by Sonnichsen *et al.* (1973), and fish screen velocity criteria that are consistent with this approach. **[*41602]**

2. Meeting Performance Standards Through the Use of Design and Construction Technologies, Operational Measures, and/or Restoration Measures

Under the second and third compliance alternatives (§ 125.94(a)(2) and (3)), a facility may either demonstrate to the Director that the facility's existing design and construction technologies, operational measures, and/or restoration measures already meet the minimum performance standards specified under § 125.94(b) and (c), or that it has selected design and construction technologies, operational measures, and/or restoration measures

or some combination thereof that will meet these performance standards.

Available data indicate that, when considered as a suite of technologies, barrier and fish handling technologies are available on a national basis for use by Phase II existing facilities. These technologies exist and are in use at various Phase II facilities and, thus, EPA considers them collectively technologically achievable. In addition, 50 percent of the potentially regulated facilities that do not already have closed-cycle cooling systems have some other technology in place that reduces impingement or entrainment. In turn, a large subset of these facilities (33 percent) also have fish handling or return systems that reduce the mortality of impinged organisms. The fact that these technologies are collectively available means that one or more technologies within the suite is available to each Phase II facility.

EPA finds that the design and construction technologies necessary to meet the requirements are commercially available and economically practicable for existing facilities, because facilities can and have installed many of these technologies years after a facility began operation. Typically, additional design and construction technologies such as fine mesh screens, wedgewire screens, fish handling and return systems, and aquatic filter fabric barrier systems can be installed during a scheduled outage (operational shutdown). Referenced below are examples of facilities that installed these technologies after they initially started operating.

Lovett Generating Station. A 495 MW facility (gas-fired steam), Lovett is located in Tomkins Cove, New York, along the Hudson River. The facility first

began operations in 1949 and has three generating units with once-through cooling systems. In 1994, Lovett began the testing of an aquatic filter barrier system to reduce entrainment, with a permanent system being installed the following year. Improvements and additions were made to the system in 1997, 1998, and 1999, with some adjustments being accepted as improvements of this vendor's technology for all subsequent installations at other locations.

Big Bend Power Station. Situated on Tampa Bay, Big Bend is a 1998 MW (coal-fired steam) facility with four generating units. The facility first began operations in 1970 and added generating units in 1973, 1976, and 1985. Big Bend supplies cooling water to its once-through cooling water systems via two intake structures. When the facility added Unit 4 in 1985, regulators required the facility to install additional intake technologies. A fish handling and return system, as well as a fine-mesh traveling screen (used only during months with potentially high entrainment rates), were installed on the intake structure serving both the new Unit 4 and the existing Unit 3.

Salem Generating Station. A 2381 MW facility (nuclear), Salem is located on the Delaware River in Lower Alloways Creek Township, New Jersey. The facility has two generating units, both of which use once-through cooling and began operations in 1977. In 1995, the facility installed modified Ristroph screens and a low-pressure spray wash with a fish return system. The facility also redesigned the fish return troughs to reduce fish trauma.

Chalk Point Generating Station. Located on the Patuxent River in Prince George's County, Maryland, Chalk Point has a capacity of 2647 MW (oil-fired steam). The facility has four generating units and uses a combination of once-through and closed-cycle, recirculating cooling systems (two once-through systems serving two generating units and one recirculating system with a tower serving the other two generating units). In 1983, the facility installed a barrier net, followed by a second net in 1985, giving the facility a coarse mesh (1.25") outer net and a fine mesh (.75") inner net. The barrier nets are anchored to a series of pilings at the mouth of the intake canal that supplies the cooling water to the facility and serve to reduce both entrainment and the volume of trash taken in at the facility.

3. Meeting Performance Standards Through Use of an Approved Design and Construction Technology

Under the fourth compliance alternative, a facility can demonstrate that it meets specified conditions and that it has installed and properly operates and maintains a pre-approved technology. EPA is approving one technology at this time: submerged cylindrical wedgewire screen technology to treat the total cooling water intake flow. There are five conditions that must be met in order to use this technology to comply with the rule: (1) The cooling water intake structure is located in a freshwater river or stream; (2) the cooling water intake structure is situated such that sufficient ambient counter currents exist to promote cleaning of the screen face; (3) the through screen design intake velocity is 0.5 ft/s or less; (4) the slot size is appropriate for the size of eggs, larvae, and juveniles

of any fish and shellfish to be protected at the site; and (5) the entire main condenser cooling water flow is directed through the technology (small flows totaling less than two MGD for auxiliary plant cooling uses are excluded). Directors are explicitly authorized in to pre-approve other technologies for use at facilities with other specified characteristics within their respective jurisdiction after providing the public with a notice and an opportunity to comment on the request for approval of the technology. The Director's authority to pre-approve other technologies is not limited to technologies for use by facilities located on freshwater rivers and streams.

EPA has adopted this compliance alternative in response to comments that suggested that EPA provide an additional, more streamlined compliance option under which a facility could implement certain specified technologies that are deemed highly protective in exchange for reducing the scope of the Comprehensive Demonstration Study. (*See* 68 FR 13522, 13539; March 19, 2003). EPA evaluated the effectiveness of specific technologies using the impingement mortality and entrainment reduction performance standards as assessment criteria. The technology selected for the approved technology option has a demonstrated ability to reduce impingement mortality by 80 to 95 percent for fish and shellfish and, if required, reduce entrainment by 60 to 90 percent for any stages of fish and shellfish at facilities that meet the conditions specified in § 125.99(a). Thus, the technology has a demonstrated ability to meet the most stringent performance standards that would apply to any facility situated on a freshwater river or stream. (*See*

DCN 1-3075, 1-5069, 1-5070, 3-0002, and 4-4002B. *Also see*, DCN 6-5000 and Chapter 3 of the Technical Development Document.) Because cylindrical wedgewire screens are believed to be effective when deployed under the **[*41603]** specified conditions and properly maintained, facilities that select this compliance option are provided substantially streamlined requirements for completing the Comprehensive Demonstration Study. However, facilities selecting this option are still required to prepare a Technology Installation and Operation Plan to monitor the effectiveness of the technology at their site in meeting the performance standards.

4. Site-Specific Determination of Best Technology Available To Minimize Adverse Environmental Impact

A facility may comply with the rule by seeking a site-specific demonstration of the best technology available to minimize adverse environmental impact by demonstrating, to the Director's satisfaction, that its cost of complying with the applicable performance standards would be significantly greater than the costs considered by EPA for a like facility when establishing such performance standards, or that its costs would be significantly greater than the benefits of complying with such performance standards at the facility. (*See* § 125.94(a)(5)(i) and (ii)). If a facility satisfies one of the two cost tests in § 125.94(a)(5), then the Director must establish site-specific alternative requirements based on design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that is, in the judgment of the Director, as close as practicable to the applicable performance standards

without resulting in costs that are significantly greater than either the costs considered by the Administrator in establishing the applicable performance standards, or the benefits at the facility.

In establishing the performance standards in 125.94(b) and the compliance alternatives in sections 125.94(a)(1)–(4), EPA considered several factors, including efficacy, availability, ease of implementation, indirect effects, the costs that EPA expects all existing facilities to incur (national costs) and the benefits if all existing facilities meet the performance standards (national benefits). This provision for alternative requirements is included in the rule to give facilities flexibility to demonstrate that the best technology available to minimize adverse environmental impact at their particular sites may be less stringent than would otherwise be achieved if the facility selected one of the compliance alternatives in sections 125.94(a)(1)–(4). (For a discussion of EPA's legal authority to authorize compliance with alternative requirements based on this cost-cost comparison, *see* Section VIII. I.).

a. Basis of the Cost-Cost Test

For a number of related reasons, EPA chose to use a comparison of a facility's actual costs to the costs EPA estimated that facility would incur to meet the national performance standards (a "cost-cost test") as a basis for obtaining a site-specific determination of best technology available. EPA's record for this rule shows that, for the category of existing facilities as a whole, today's rule is technically achievable and economically practicable. Although EPA collected more information for this rulemaking than is typical for an effluent limitation guideline rulemaking,

detailed information on some factors important to the effectiveness and costs of the technologies, such as debris loading and the presence of navigational channels within the waterbody at which cooling water intakes are sited, was not requested. Moreover, the information EPA used to develop its costs was in some cases limited by the fact that, while EPA sent surveys to all facilities covered under today's rule, only 42% were sent detailed questionnaires. The remaining 58% only received a short technical questionnaire which requested minimal characterization information. Also, EPA may not have elicited information regarding characteristics of a particular facility that, if known would have either significantly changed EPA's national cost estimates or demonstrated that none of the technologies on which the categorical requirements are based are economically achievable by the facility. Similarly, existing facilities have less flexibility than new facilities in selecting the location of their intakes and technologies for minimizing adverse environmental impact, and therefore it may be difficult for some facilities to avoid costs much higher than those EPA considered when establishing the performance standards. The cost-cost site-specific alternative ensures that the overall rule remains economically practicable for facilities subject to today's rule. In short, for certain facilities EPA may not have anticipated some site-specific costs or the costs for retrofit may exceed those EPA considered. Despite EPA's best effort, such costs are difficult to estimate in a national rule. Because of the wide range of available technologies considered and a number of site-specific factors that may significantly affect the cost and practicability of

installing particular technologies at particular sites, the site-specific uncertainty in the cost estimates is higher than for an effluent limitations guidelines rulemaking. Thus, EPA may not have anticipated all site-specific costs that a facility could incur. In addition, existing facilities have less flexibility than new facilities in selecting the location of their intakes and technologies for minimizing adverse environmental impact and, therefore, it may be difficult for some facilities to avoid costs much higher than those EPA considered when establishing the performance standards in the rule. For all of these reasons, EPA believes that the cost-cost site-specific compliance alternative is necessary to ensure that the rule is economically practicable for existing Phase II facilities. In order to ensure that this alternative provides only the minimum relaxation of performance standards that is needed to make the rule economically practicable, requires that the site-specific requirements achieve an efficacy that is as close as practicable to the applicable performance standards without resulting in costs that are significantly greater than those considered by the Administrator for a like facility when establishing the performance standards.

b. Basis of the Cost-Benefit Test

EPA decided to use a comparison of a facility's costs to the benefits of meeting the performance standards at the facility (a "cost-benefit test") as another basis for obtaining a site-specific determination of BTA to minimize adverse environmental impact. Section 316(b) authorizes consideration of the environmental benefit to be gained by requiring that the location, design,

construction, and capacity of cooling water intake structures reflect the best economically practicable technology available for the purpose of minimizing adverse environmental impact. Accordingly, in determining that the technologies on which EPA based the compliance alternatives and performance standards are the best technologies available for existing facilities to minimize adverse environmental impact, EPA considered the national cost of those technologies in comparison to the national benefits—*i.e.*, the reduction in impingement and entrainment that EPA estimated would occur nationally if all existing facilities selected one of the compliance options in § 125.94(a)(1)–(4). While EPA believes that there is considerable value in promulgating national performance standards under section 316(b) based on what EPA determines, on a national basis, to be the best technology available to minimize adverse environmental impacts, EPA also recognizes that, at **[*41604]** times, determining what is necessary to minimize adverse environmental impacts can necessitate a site-specific inquiry. EPA's comparison of national costs to national benefits may not be applicable to a specific site due to variations in (1) the performance of intake technologies and (2) characteristics of the waterbody in which the intake(s) are sited, including the resident aquatic biota. For example, there may be some facilities where the absolute numbers of fish and shellfish impinged and entrained is so minimal that the cost to achieve the required percentage reductions would be significantly greater than the benefits of achieving the required reductions at that particular site. More specifically, because of the location of the intake, the characteristics of a particular waterbody, or the

behavioral patterns of the fish or shellfish in that particular waterbody, there may be little or no impingement mortality or entrainment occurring at the site (see Neal Generating Complex facility example provided in section IV of this preamble). For such a facility, the cost of reducing an already small amount of impingement mortality and entrainment by 80 to 95 percent and 60 to 90 percent, respectively, may be significantly greater than the benefits. In short, it may not be cost-effective and, therefore may be economically impracticable for a facility to achieve percentage reductions when attempting to save a small number of fish or shellfish. Thus, in a waterbody that is already degraded, very few aquatic organisms may be subject to impingement or entrainment, and the costs of retrofitting an existing cooling water intake structure may be significantly greater than the benefits of doing so. By requiring best technology available to minimize adverse environmental impact, section 316(b) invites a consideration of both technology and of environmental conditions, including the potential for adverse impacts, in the receiving waterbody. EPA believes it is a reasonable interpretation of the statute to allow the Director to consider the results of meeting the performance standards in terms of reducing environmental impacts (*i.e.*, the benefits) in cases where the costs of installing the technology are significantly greater than the reduction in environmental impacts would warrant. As with the cost-cost site-specific provision, EPA also wants to ensure that any relaxation of the performance standards be the minimum necessary to ensure that the costs are not significantly greater than the benefits. thus provides that alternative

site-specific requirements must achieve an efficacy that is as close as practicable to the applicable performance standards without resulting in costs that are significantly greater than the benefits of meeting the performance standards at the facility.

D. How Has EPA Assessed Economic Practicability?

The legislative history of section 316(b) indicates that the term "best technology available" should be interpreted as "best technology available commercially at an economically practicable cost."[45] This position reflects congressional concern that the application of best technology available should not impose an impracticable and unbearable economic burden. Thus, EPA has conducted extensive analyses of the economic impacts of this final rule, using an integrated energy market model (the IPM 45). For a complete discussion of this analysis, please refer to section XI.B.1 of this preamble or Chapter B3 of the Economic and Benefits Analysis (EBA) in support of this final rule (DCN 6-0002).

EPA believes that the requirements of this rule reflect the best technology available at an economically practicable cost. EPA examined the effects of the rule's compliance costs on capacity, generation, variable production costs, prices, net income, and other measures, both at the market and facility levels. In addition, the other economic analyses conducted by EPA showed that the costs for this rule are economically practicable.

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[45] See 118 CONG. REC 33,762 (1972), reprinted in 1 Legislative History of the Water Pollution Control Act Amendments of 1972, at 264 (1973) (Statement of Representative Don H. Clausen).

However, EPA believes that a consideration of the relationship of costs to environmental benefits is an important component of economic practicability. As discussed in section VIII.C of the proposed Phase I rule (65 FR 49094) EPA has long recognized that there should be some reasonable relationship between the cost of cooling water intake structure control technology and the environmental benefits associated with its use. As the preamble to the 1976 final rule implementing section 316(b) stated, neither the statute nor the legislative history requires a formal or informal cost-benefit assessment (41 FR 17387; April 26, 1976).

E. What Were the Major Options Considered for the Final Rule and Why Did EPA Reject Them?

EPA considered a number of options for determining the best technology available to minimize adverse environmental impact at Phase II existing facilities and assessed these options based on overall efficacy, availability, economic practicability, including economic impact and the relationship of costs with benefits, and non-water quality environmental impacts, including energy impacts. Under the options EPA considered, facilities would be allowed to implement restoration measures to meet the performance standards. Similarly, any options considered also would allow facilities to request alternative, less stringent, requirements if the Director had determined that data specific to the facility indicated that compliance with the relevant requirement would result in compliance costs significantly greater than those EPA considered in establishing the applicable requirement, or compliance costs significantly

greater than the benefits of complying with the applicable performance standards. The alternative requirements would be no less stringent than justified by the significantly greater cost or the significant adverse impacts on local air quality or local energy markets. EPA also considered several site-specific approaches to establishing best technology available. These include the site-specific sample rule discussed at 67 FR 17159, an alternative based on EPA's 1977 Draft Guidance, and alternatives suggested by the Utility Water Act Group (UWAG) and Public Service Electric and Gas Company (PSEG), respectively (*see* 67 FR 17162). EPA's reasons for not adopting these site specific alternatives are discussed in section VII.E.5 of this preamble. The five major technology options EPA considered but did not select for the final rule are discussed in greater detail in the next section. Finally, the costs and benefits presented below are those developed at proposal because these estimates are most useful for purposes of comparison. Subsequent analyses, such as those presented in the NODA, have resulted in higher cost estimates in general, but did not alter the relative ranking of these options as EPA made determinations regarding the final rule. Rather, these analyses indicated that the costs for options that would have required more extensive retrofitting efforts than the final rule are even higher relative to the costs of the final *41605 rule than they were estimated to be at proposal.

1. Intake Capacity Commensurate With Closed-Cycle, Recirculating Cooling System for All Facilities

EPA considered a regulatory option that would have required Phase II existing facilities with a

design intake flow 50 MGD or more to reduce the total design intake flow to a level, at a minimum, commensurate with that which can be attained by a closed-cycle recirculating cooling system using minimized make-up and blowdown flows. In addition, facilities in specified circumstances (*e.g.*, located where additional protection is needed due to concerns regarding threatened, endangered, or protected species or habitat; or regarding migratory, sport or commercial species of concern) would have had to select and implement additional design and construction technologies to minimize impingement mortality and entrainment. This option would not have distinguished between facilities on the basis of the waterbody type from which they withdraw cooling water. Rather, it would have required that the same stringent controls be the nationally applicable minimum for all waterbody types. This is the basic regulatory approach EPA adopted for new facilities at 40 CFR 125.80.

EPA did not select a regulatory scheme based on the use of closed-cycle, recirculating cooling systems at existing facilities based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations. Although closed-cycle, recirculating cooling water systems serve as the basis for requirements applied to Phase I new facilities, for Phase II existing facilities, a national requirement to retrofit existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable. EPA estimates that the total capital costs for individual high-flow plants (*i.e.*,

greater than 2 billion gallons per day) to convert to wet towers generally ranged from $130 to $200 million, with annual operating costs in the range of $4 to $20 million (*see* TDD; DCN 6-0004). For purposes of general comparison, EPA estimated that capital and installation costs for cooling towers under the Phase I rule would range from approximately $170,000 to $12.6 million per plant (annualized), depending on flow. At proposal, EPA estimated that the total social cost of compliance for this option for Phase II existing facilities would be approximately $3.5 billion per year.

It is significant to note, however, that EPA's estimates did not fully incorporate costs associated with acquiring land needed for cooling towers and, therefore, these estimates may not fully reflect the costs of the option. For example, based on a survey conducted by one industry commenter, EPA learned that 31 out of 56 plants surveyed said that they would need to acquire additional property to accommodate cooling towers, if required by today's rule. EPA recognizes that this could be a significant cost. EPA also recognizes that there may be impediments, irrespective of costs, to acquiring land for cooling towers. Land upon which to construct cooling towers may be difficult or impossible to obtain, especially in urban areas; some facilities might even turn to displacement of wetlands as a solution. The Agency did not include these potential costs in its analysis for the NODA or proposal. In contrast to new facilities, which can take into account the Phase I requirements when choosing where to situate their structures (including cooling towers), existing facilities have far less flexibility and incur far greater costs. EPA believes that this is a

special problem for existing facilities that is relevant to determining whether, as a national categorical matter, closed-cycle cooling is the best technology available for existing facilities for minimizing adverse environmental impacts associated with cooling water intake structures. EPA received retrofit cost estimates from a number of commenters that indicate that such costs could be at least twice those projected by EPA.

Another issue concerns the energy impacts of cooling towers. EPA examined the information it received after publication of the proposed rule and NODA, and agrees that the energy penalty associated with cooling towers, together with other factors, indicates that this technology is not the best technology available for existing facilities for minimizing adverse environmental impacts associated with cooling water intake structures. In reaching this conclusion, EPA relied on energy penalty information provided by the U.S. Department of Energy. EPA worked closely with the U.S. Department of Energy in preparing today's rule because of their expertise in power plant operations and engineering. The U.S. Department of Energy pointed out to EPA that existing fossil-fuel facilities converting from once-through cooling water systems to wet-cooling towers would produce 2.4 percent to 4.0 percent less electricity even while burning the same amount of coal. For at least one nuclear power plant, which provides 78% of the electricity consumed by the State of Vermont, the energy penalty associated with converting to cooling towers was estimated to be 5.3 percent. Expressed differently, DOE estimated that nationally, on average 20 additional 400-MW plants might have to

be built to replace the generating capacity lost by replacing once-through cooling systems with wet cooling towers if such towers were required by all Phase II facilities.

This energy penalty leads to other negative consequences. Because this deficit is predicted to occur during the summer months (when energy demand is highest), the net effect would be more consumption of fossil fuel, which in turn increases the emission of sulfur dioxide, NOX, particulate matter, mercury and carbon dioxide. Increasing fuel consumption at existing coal power plants yields the largest increase in air emissions because existing systems are less efficient at producing power (and therefore burn more coal) and because they generally have less air pollution control equipment in place. EPA believes that it is reasonable to consider these non-water quality environmental impacts and the additional costs associated with controlling these increased emissions in making today's decision. EPA further believes that it is authorized to do so because of the links between § 316(b) and sections 301 and 306, which require EPA to consider both the energy impacts and the air pollution impacts of technologies when identifying technologies in the effluent guidelines context. *See* CWA section 304(b)(2)(B) (cross-referenced in § 301); CWA section 306(b)(1)(B) (new source performance standards).

Some commenters also assert that EPA underestimated the down time that the facility would experience as it converts to cooling towers. This, again, is not an impact that would be experienced by new facilities. EPA agrees that such down time can be significant. Indeed, one of the four

retrofit case studies EPA developed indicated a down time of 10 months, and EPA believes it is reasonable to infer that many other facilities would experience the same loss.

EPA also agrees with the commenters who assert that the empirical data base of four retrofit cases to which EPA compared cooling tower retrofit costs and engineering characteristics is not representative of the broader population of facilities and could be too narrow a set from which to develop national costs that would be applicable to a wide range **[*41606]** of facilities. Of the four retrofits EPA studied, two were in a single state (South Carolina), none were located along a coast, and only one generated more than 500 MW of electricity. EPA also recognizes that all of these conversions were performed before 1992. While it is true that the vast majority of the new, greenfield utility and non-utility combined cycle plants built in the past 20 years have wet cooling towers, EPA believes that it is significant that so few existing facilities retrofitted to the technology during the same period. The rarity of this technology as a retrofit further indicates that it is not economically practicable for the vast majority of existing facilities.

EPA also considered several additional points made by commenters in rejecting this option. Some commenters asserted that certain facilities with closed-cycle, recirculating cooling systems often need to address the impacts of cooling tower plumes, and subsequent fog and icing in metropolitan areas, and noise abatement. Commenters also asserted that the costs of retrofitting and operating such systems at facilities which do not now have them is disproportionate to the potential benefits derived.

particularly given the similarity in the level of protection provided under this option (all facilities required to reduce flow commensurate with a closed-cycle, recirculating system) and the final rule. Finally, they stated that the need for flexibility in a rule pertaining to existing facilities is critical to allow facility owners a range of options to meet the fish protection requirements. EPA does not agree that in all cases the costs of retrofitting a closed-cycle cooling water system is disproportionate to the benefits derived. Nevertheless, EPA recognizes that these concerns have merit for many facilities and that the validity and extent of such concerns often must be assessed on a case-by-case basis.

Each of these factors has a cost and an economic impact that EPA believes is appropriate to consider when evaluating whether cooling towers are the best technology available for existing facilities for minimizing adverse environmental impacts associated with cooling water intake structures. The capital costs estimated by EPA at proposal are already very high; when costs reflecting reasonable changes to EPA's assumptions are added to them, the total capital cost investment and associated economic impact is simply too high at this time for EPA to be able to justify selecting cooling towers as a required technology for all existing Phase II facilities.

EPA further compared the efficacy of closed-cycle, recirculating cooling systems with that estimated for design and construction technologies. Although not identical, the ranges of impingement and entrainment reduction are similar under both options, such that the reductions estimated for the

design and construction technologies, particularly when optimized, approach those estimated for closed-cycle, recirculating cooling systems. Therefore, the use of design and construction technologies as the basis for this rule is supported since they can approach closed-cycle, recirculating systems at less cost with fewer implementation problems. EPA considered this similarity in efficacy, along with the economic practicability and availability of each type of technology, in determining that a closed-cycle, recirculating cooling system is not the required technology for all Phase II existing facilities.

2. Intake Capacity Commensurate With Closed-Cycle, Recirculating Cooling Systems Based on Waterbody Type

EPA also considered an alternate technology-based option in which closed-cycle, recirculating cooling systems would have been required for all facilities on certain waterbody types. Under this option, EPA would have grouped waterbodies into the same five categories as in today's rule: (1) Freshwater rivers or streams, (2) lakes or reservoirs, (3) Great Lakes, (4) tidal rivers or estuaries; and (5) oceans. Because oceans, estuaries and tidal rivers contain essential habitat and nursery areas for the vast majority of commercial and recreational important species of shell and finfish, including many species that are subject to intensive fishing pressures, these waterbody types would have required more stringent controls based on the performance of closed-cycle, recirculating cooling systems. EPA discussed the susceptibility of these waters in a Notice of Data Availability (NODA) for the Phase I rule (66 FR 28853, May 25, 2001) and invited comment on

documents that may support its judgment that these waters are particularly susceptible to adverse impacts from cooling water intake structures. In addition, the NODA presented information regarding the low susceptibility of non-tidal freshwater rivers and streams to impacts from entrainment from cooling water intake structures.

Under this alternative option, facilities that operate at less than 15 percent capacity utilization would, as in today's final rule, only be required to have impingement control technology. Facilities that have a closed-cycle, recirculating cooling system would have required additional design and construction technologies to increase the survival rate of impinged biota or to further reduce the amount of entrained biota if the intake structure was located within an ocean, tidal river, or estuary where there are fishery resources of concern to permitting authorities or fishery managers.

Facilities with cooling water intake structures located in a freshwater (including rivers and streams, the Great Lakes and other lakes) would have had the same requirements as under today's final rule. If a facility for which closed-cycle recirculating technology was required chose to comply with alternative requirements, then the facility would have had to demonstrate that alternative technologies would reduce impingement and entrainment to levels comparable to those that would be achieved with a closed-loop recirculating system (90% reduction). If such a facility chose to supplement its alternative technologies with restoration measures, it would have had to demonstrate the same or substantially similar level

of protection. (For additional discussion see the Phase I final rule 66 FR 65256, at 65315 columns 1 and 2.)

At proposal, EPA estimated that there would be 109[46] facilities located on oceans, estuaries, or tidal rivers that do not have a closed-cycle, recirculating cooling system and would need to reduce intake flow to a level commensurate with that which can be attained by a closed-cycle, recirculating cooling system or upgrade design and construction technology (*e.g.*, screens) in order to meet performance standards for reducing impingement mortality and entrainment.

Although EPA estimated the costs of this option to be less expensive at the national level than an option based on closed-cycle, recirculating cooling systems everywhere, EPA did not select this option based on total social costs estimates of greater than $1 billion per year and its lack of cost-effectiveness, as well as on concerns regarding potential energy impacts. Facilities located on oceans, estuaries, and tidal rivers would incur high capital and operating and maintenance costs for conversions of their cooling water systems. Furthermore, since impacted facilities would be concentrated in coastal regions, EPA is concerned that there is *41607 the potential for short term energy impacts and supply disruptions in these areas if multiple facilities retrofit concurrently or over a relatively short time-frame, as would be required by these regulations.

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[46] Sample-weighted.

3. Intake Capacity Commensurate With Closed-Cycle, Recirculating Cooling System Based on Waterbody Type and Proportion of Waterbody Flow

EPA also considered a variation on the above approach that would have required only facilities withdrawing very large amounts of water from an estuary, tidal river, or ocean to reduce their intake capacity to a level commensurate with that which can be attained by a closed-cycle, recirculating cooling system. For example, for facilities with cooling water intake structures located in a tidal river or estuary, if the intake flow is greater than 1 percent of the source water tidal excursion, then the facility would have had to meet standards for reducing impingement mortality and entrainment based on the performance of wet cooling towers. These facilities would instead have had the choice of reducing cooling water intake flow to a level commensurate with wet cooling towers or of using alternative technologies to meet reduction standards based on the performance of wet cooling towers. If a facility on a tidal river or estuary had intake flow equal to or less than 1 percent of the source water tidal excursion, the facility would have only had to meet the same impingement and entrainment performance standards as in the final Phase II rule. These standards were developed based on the performance of technologies such as fine mesh screens and traveling screens with well-designed and operating fish return systems. The more stringent, closed-cycle, recirculating cooling system-based requirements would have also applied to a facility that has a cooling water intake structure located in an ocean with an intake flow greater than 500 MGD.

1. This option also would impose much higher costs on a subset of facilities than the final rule. Based on an analysis of data collected through the detailed industry questionnaire and the short technical questionnaire, at proposal, EPA estimated there were potentially 109 Phase II existing facilities located on estuaries, tidal rivers, or oceans which would incur capital costs under this option. Of these 109 facilities, EPA estimated that 51 would exceed the applicable flow threshold and be required to meet performance standards for reducing impingement mortality and entrainment based on a reduction in intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating system. Of the 58[47] facilities estimated to fall below the applicable flow threshold, 10 facilities already meet these performance standards and would not require any additional controls, whereas 48[48] facilities would require entrainment or impingement controls, or both. Because this option would only require cooling tower-based performance standards for facilities located on tidal rivers, estuaries or oceans where they withdraw saline or brackish waters, EPA does not believe that this option would raise any significant water quantity issues.

At proposal, EPA estimated the total social cost of compliance for the waterbody/capacity-based option to be approximately $0.97 billion per year. EPA did

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[47] Not sample-weighted.

[48] Not sample-weighted.

not select this option because it was not determined to be the most cost-effective approach on a national basis. While the national costs of this option are slightly lower than those of requiring wet cooling towers-based performance standard for all facilities located on oceans, estuaries and tidal rivers, the cost for facilities to meet these standards are still substantial. Although EPA would provide an opportunity to seek alternative requirements to address locally significant air quality or energy impacts, EPA does not believe a framework such as this provides sufficient flexibility to ensure effective implementation and to minimize non-water quality (including energy) impacts. In addition, as noted above for the other cooling tower based options that EPA rejected, facilities can achieve almost the same level of impingement mortality and entrainment reductions using the technologies on which this final rule is based as they can using cooling towers, but at substantially lower cost.

4. Impingement Mortality and Entrainment Controls Everywhere

At proposal, EPA evaluated an option that required impingement mortality and entrainment controls for all facilities. This option did not allow for the development of best technology available on a site-specific basis. This alternative based requirements on the percent of source water withdrawn and, like today's final rule, also restricted disruption of the natural thermal stratification of lakes or reservoirs. It also imposed entrainment performance requirements on Phase II existing facilities located on freshwater rivers or streams, and lakes or reservoirs where EPA has determined in

today's final rule that such controls are not necessary. Finally, under this alternative, restoration could be used, but only as a supplement to the use of design and construction technologies or operational measures.

This option established clear performance-based requirements that were based on the use of available technologies to reduce adverse environmental impact. Such an alternative would be consistent with the focus on use of best technology required under section 316(b). However, as indicated above, this option lacks the flexibility of the final rule in applying the necessary and appropriate available technology and therefore would be less effective in addressing the specific cooling water intake structure impacts posed by Phase II facilities in their various environmental settings.

At proposal, total social cost of compliance for this option was estimated at approximately $300 million per year. EPA did not select this option because other options were more cost-effective, in part because this option requires entrainment controls in freshwater rivers, streams, and lakes. The benefits of the final rule are almost the same as those for this option but a lower cost (since lakes and reservoirs, and for design intake flows below 5% in freshwater rivers and streams are the least likely to provide significant benefits).

5. Site-Specific Options as Best Technology Available To Minimize Adverse Environmental Impact

In the proposed rule EPA also considered several site-specific approaches to establishing best technology available. These include the site-specific

sample rule discussed at 67 FR 17159, an alternative based on EPA's 1977 Draft Guidance (67 FR 17161), and alternatives suggested by UWAG and PSEG, respectively (*see* 67 FR 17162).

EPA did not adopt any of these site-specific regulatory options for several reasons. None of these site-specific approaches would have established national performance standards for best technology available to minimize adverse environmental impact. EPA believes that such national performance standards promote the consistent application of the best technology available to minimize adverse environmental impact. In addition, based on contact with States (*see* Phase I NODA, 66 FR 28865, Phase II proposal 67 FR 17152–3) and anecdotal **[*41608]** information[49] EPA believes that each of these site-specific options would have resulted in higher administrative burdens being imposed on applicants and permit writers relative to the final rule. As EPA has discussed in the preamble to the proposal (*see* 67 FR 17167), these administrative burdens can be associated with the need to determine in each case whether adverse impacts are occurring, the nature and level of any such impacts, and which design and

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[49] For example, a site-specific determination for Brayton Point, Rhode Island, has required resources for greater than two full time equivalents (FTEs) over three years for permitting and support staff, as well as approximately $400,000 in contractor costs to address technical issues and applicant experts. Similarly, development of a permit for Salem has required resources for greater than two full time equivalents (FTEs) over three years for permitting and support staff, as well as approximately $340,000 in contractor costs to address technical issues and applicant experts.

construction technologies constitute the best technology available to minimize adverse environmental impacts, including a consideration of costs and benefits. Further, all of the proposed site-specific options increase the likelihood that each significant cooling water intake permitting issue would become a point of contention between the applicant and permit writer, which EPA's experience indicates slows the permitting process, makes it more resource intensive, and makes it more costly. Finally, because the final rule provides facilities with the option of selecting from five compliance alternatives, including a site-specific compliance alternative, the final rule provides facilities with flexibility comparable to that of a site-specific rule. The site-specific alternative in the final rule provides clear standards for eligibility (the cost-cost and cost-benefit tests), and clear standards on which to base the alternative requirements that they achieve an efficacy as close as practicable to the national performance standards without exceeding the cost-test or benefits-test thresholds. EPA believes that structuring a site-specific compliance alternative in this way will significantly reduce the potential areas of disagreement between permit writer and applicant that are inherent in the other site-specific approaches that it rejected, while still providing facilities with appropriate flexibility. Through the multiple compliance alternatives specified in this rule, EPA has sought to balance the statutory requirements of section 316(b) and the need for reasonable limits on the administrative burden imposed on both applicants and permit writers against the need for existing facilities to have flexibility in implementing the requirements.

6. Flow Reduction Commensurate With the Level Achieved by Dry Cooling Systems Based on Waterbody Type

EPA conducted a full analysis for the Phase I rule and concluded that dry cooling was not an economically practicable option for new facilities on a national basis. Dry cooling systems use either a natural or a mechanical air draft to transfer heat from condenser tubes to air. In conventional closed-cycle recirculating wet cooling towers, cooling water that has been used to cool the condensers is pumped to the top of a recirculating cooling tower; as the heated water falls, it cools through an evaporative process and warm, moist air rises out of the tower, often creating a vapor plume. Hybrid wet-dry cooling towers employ both a wet section and dry section and reduce or eliminate the visible plumes associated with wet cooling towers.

For the Phase I rule, EPA evaluated zero or nearly zero intake flow regulatory alternatives, based on the use of dry cooling systems. EPA determined that the annual compliance cost to industry for this option would be at least $490 million. EPA based the costs on 121 new facilities having to install dry cooling. For the Phase II proposal, EPA estimated that total social costs for dry cooling based on waterbody type were $2.1 billion per year (or roughly double the costs for wet towers). Thus, this option would be more expensive than dry cooling for new facilities. The cost for Phase II existing facilities to install dry cooling would be significantly higher than the cost for new facilities to do so due to the complexities of retrofitting both the dry cooling equipment and components of the cooling system. At proposal, EPA

estimated that 550 Phase II existing facilities would be subject to Phase II regulation. The cost would be significantly higher because existing facilities have less flexibility, thus incurring higher compliance costs (capital and operating) than new facilities. For example, existing facilities might need to upgrade or modify existing turbines, condensers, and/or cooling water conduit systems, which typically imposes greater costs than use of the same technology at a new facility. In addition, retrofitting a dry cooling tower at an existing facility would require shutdown periods during which the facility would lose both production and revenues, and decrease the thermal efficiency of an electric generating facility.

The disparity in costs and operating efficiency of dry cooling systems compared with wet cooling systems is considerable when viewed on a nationwide or regional basis. For example, under a uniform national requirement based on dry cooling, facilities in the southern regions of the United States would be at an unfair competitive disadvantage compared to those in cooler northern climates because dry cooling systems operate more efficiently in colder climates. Even under a regional subcategorization strategy for facilities in cool climatic regions of the United States, adoption of a minimum requirement based on dry cooling would likely impose unfair competitive restrictions for steam electric power generating facilities because of the elevated capital and operating costs associated with dry cooling. Adoption of requirements based on dry cooling for a subcategory of facilities under a particular capacity would pose similar competitive disadvantages for those facilities.

As explained in the preamble to the proposal, EPA does not consider performance standards based on dry cooling a reasonable option for a national requirement, nor for subcategorization under this rule, because the technology of dry cooling carries costs that would potentially cause significant closures for Phase II existing facilities. Dry cooling technology would also have a significant detrimental effect on electricity production by reducing the energy efficiency of steam turbines. Unlike a new facility that can use direct dry cooling, an existing facility that retrofits for dry cooling would most likely use indirect dry cooling which is much less efficient than direct dry cooling. In contrast to direct dry cooling, indirect dry cooling does not operate as an air-cooled condenser. In other words, the steam is not condensed within the structure of the dry cooling tower, but instead indirectly through a heat exchanger. Therefore, the indirect dry cooling system would need to overcome additional heat resistance in the shell of the condenser compared to the direct dry cooling system. Ultimately, the inefficiency (*i.e.*, energy penalty) of indirect dry cooling systems will exceed those of direct dry cooling systems in all cases.

Although the dry cooling option is extremely effective at reducing impingement and entrainment, it is not economically practicable for existing facilities and would cause additional adverse environmental impacts and serious energy impacts. Although dry cooling technology uses extremely low-**[*41609]** level or no cooling water intake, thereby reducing impingement and entrainment of organisms to extremely low levels, section 316(b) does not require that adverse environmental impact

be completely eliminated, but that it be minimized using the best technology available. (DOE energy penalty study; DCN 4-2512). EPA does not believe that dry cooling technology is "available" to most Phase II existing facilities.

Although EPA has rejected dry and wet cooling tower technologies as a national minimum requirement, EPA does not intend to restrict the use of these technologies or to dispute that they may be the appropriate cooling technology for some facilities. For example, facilities that are repowering and replacing the entire infrastructure of the facility may find that dry cooling is an acceptable technology in some cases. This technology may be especially appropriate in situations where access to cooling water is limited. Wet cooling tower technology may be suitable where adverse effects of cooling water intakes are severe and where screening systems are impractical, or where thermal discharge impacts pose serious environmental problems. Under Clean Water Act section 510, a State may choose to impose more stringent standards than required by Federal regulations. States may continue to use this authority to require facilities to use dry or wet cooling systems.

F. What Is the Role of Restoration and Trading Under Today's Final Rule?

1. What Is the Role of Restoration?

EPA is providing facilities with the option to use restoration for compliance alternatives § 125.94(a)(2), (3), and (5) where the performance of the restoration measures (the production and increase of fish and shellfish in the facility's

waterbody or watershed, including maintenance of community structure and function), is substantially similar to that which would have been achieved if the facility reduced impingement mortality and entrainment through the use of design and construction technologies and/or operational measures, to meet the applicable performance standards. (For a complete discussion of the legal analysis supporting restoration, see section VIII of this preamble.) The role of restoration under this rule is to provide additional flexibility to facilities in complying with the rule by eliminating or significantly offsetting the adverse environmental impact caused by the operation of a cooling water intake structure. Restoration measures that increase fish and shellfish in an impacted waterbody or watershed and result in performance substantially similar to that which would otherwise be achieved through reductions in impingement mortality and entrainment further the goal of minimizing adverse environmental impact while offering additional flexibility to both permitting authorities and facilities. Restoration measures may include such activities as removal of barriers to fish migration, reclamation of degraded aquatic organism habitat, or stocking of aquatic organisms. These are still technologies, within the meaning of that term as used in section 316(b) and as such are an appropriate means for meeting technology based performance standards. They are not analogous to water quality based effluent limitations on pollutant discharges because they are not designed to meet water quality standards or dependent on the condition of the receiving waterbody. Rather, they provide an additional means to meet the same performance

standards that guide the selection of design and construction technologies and operational measures.

Restoration measures have been used at existing facilities as one of many tools to implement section 316(b) on a case-by-case, best professional judgment basis to compensate for the death and injury of fish and other aquatic organisms caused by the cooling water intake structure. Under today's rule, a Phase II existing facility may utilize restoration either in lieu of or as a supplement to design and construction technologies and/or operational measures. For example, a facility may demonstrate to the Director that velocity controls are the most feasible technology choice for the facility but that, when used on their own, the velocity controls are insufficient to meet the applicable performance standards at § 125.94(b). The facility may then, in conjunction with the use of velocity controls, implement restoration measures to increase the fish and shellfish productivity of the waterbody in order to meet the performance standards at § 125.94(b). Another facility might demonstrate to the Director that restoration measures alone achieve the greatest compliance with the performance standards. A facility may alternatively request a site-specific determination of best technology available under § 125.94(a)(5) and use restoration measures to meet the alternate requirements.

Facilities that propose to use restoration measures must demonstrate to the Director that they evaluated the use of design and construction technologies and operational measures and determined that the use of restoration measures is appropriate because meeting the applicable

performance standards or requirements through the use of other technologies is less feasible, less cost-effective, or less environmentally desirable than meeting the standards in whole or in part through the use of restoration measures. Facilities must also demonstrate that the restoration measures they plan to implement, alone, or in combination with design and construction technologies and/or operational measures, will produce ecological benefits (production of fish and shellfish) at a level that is substantially similar to the level that would be achieved through compliance with the applicable impingement mortality and/or entrainment performance standards under § 125.94(b), or alternative site-specific requirements under § 125.94(a)(5). In other words, restoration measures must replace the fish and shellfish lost to impingement mortality and entrainment, either as a substitute or as a supplement to reducing impingement mortality and entrainment through design and control technologies and/or operational measures. While the species makeup of the replacement fish and shellfish may not be exactly the same as that of the impingement mortality and entrainment losses, the Director must make a determination that the net effect is to produce a level of fish and shellfish in the waterbody that is "substantially similar" to that which would result from meeting the performance standards through design and construction technologies and/or operational measures alone. The final rule requires that a facility use an adaptive management method for implementing restoration measures because the performance of restoration projects must be regularly monitored and potentially adjusted to ensure the

projects achieve their objectives (see 67 FR 17146–17138 and 68 FR 13542).

The final rule also requires that restoration projects which replace the lost fish and shellfish with a different species mix ("out of kind" restoration) be based on a watershed approach to restoration planning. The boundaries of a "watershed" should be guided by the cataloging unit of the "Hydrologic Unit Map of the United States" (USGS, 1980), although it may be appropriate to use another watershed or waterbody classification system developed at the state or local level if such a system compares favorably in level of detail. For example, in coastal systems that support migratory fish, a coastal *41610 waterbody that transects a number of watersheds may be the most appropriate unit for planning restoration.

2. What Is the Role of Trading in Today's Rule?

In § 125.90(c), today's final rule provides that if a State demonstrates to the Administrator that it has adopted alternative regulatory requirements in its NPDES program that will result in environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under § 125.94, the Administrator must approve such alternative requirements. A trading program could be a part of these alternative regulatory requirements.

At proposal, EPA sought comment on the potential role of trading in the context of the section 316(b) Phase II rulemaking and possible approaches for developing a trading program. Trading under other

EPA programs has been shown to provide opportunities for regulatory compliance at reduced costs. The EPA Office of Water's Water Quality Trading Policy, published in January 2003 [DCN 6-5002], fully supports trading nutrients and sediment and adopts a case-by case approach to evaluating proposals to trade other pollutants.

Trading in the context of section 316(b) raises many complex issues, for example, how to establish appropriate units of trade and how to measure these units effectively given the dynamic nature of the populations of aquatic organisms subject to impingement mortality and entrainment. Should a State choose to propose a trading program under § 125.90(c), EPA will evaluate the State's proposal on a case-by-case basis to ensure the program complies with the regulatory requirement—that it will result in environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under the requirements established at § 125.94. Some commenters suggested that EPA adopt a trading program that would allow trading between aquatic organisms and pollutant discharges. EPA is concerned that such a program would introduce comparability and implementation challenges that would be difficult to overcome and therefore, EPA does not expect that such a program would work within the framework of today's final rule. In addition, EPA does not believe that it is possible at this time to quantify with adequate certainty the potential effects on ecosystem function, community structure, biodiversity, and genetic diversity of such trades, especially when threatened and/or endangered species are present. Based on the

current state of the science in aquatic community ecology and ecological risk assessment, States wishing to develop trading programs within the context of 316(b) would be best off focusing on programs based on metrics of comparability between fish and shellfish gains and losses among trading facilities, rather than the much more complex metrics that would be necessary for comparability among fish and shellfish losses on the one hand, and pollutant reductions on the other.

VIII. Summary of Major Comments and Responses to the Proposed Rule and Notice of Data Availability (NODA)

A. Scope and Applicability

1. Phase II Existing Facility Definition

Numerous commenters supported limiting the scope of the Phase II rule to existing facilities that generate and transmit electric power, or generate and sell such power to another entity for transmission, but suggested that EPA has not sufficiently limited the rule to only these facilities. Commenters noted that the proposed definition of "Phase II existing facility" does not adequately exempt existing manufacturing facilities that may occasionally transfer power off-site during peak load events. Some commenters suggested that EPA clarify the Phase II rule to specify that it does not apply to facilities whose primary business is not power generation. Some suggested limiting applicability to specified SIC codes (*e.g.*, provided that the rule only applies to facilities in SIC 4911). Examples of facilities identified by commenters that they believe should be excluded from Phase II

include manufacturers that produce electricity by co-generation, power generating units that predominantly support a manufacturer, *e.g.*, iron and steel, but also export some power, and facilities that generate power for internal use.

Commenters requested that EPA further clarify when repowering is subject to existing facility requirements. For example, some commenters viewed as inconsistent the fact that the addition of a generating unit at an existing single unit site could increase intake flows by 100% and meet the existing facility definition, while a replacement facility that increases intake flows by a much lesser amount (*e.g.*, 25%) would not meet the existing facility definition. These commenters suggested that EPA consider a facility as an existing facility unless changes to the facility result in new environmental impacts.

In § 125.91(a)(3) of today's rule, an existing facility is subject to this rule if its primary activity is either to generate and transmit electric power, or to generate electric power that it sells to another entity for transmission. This provision was included in the rule in response to comments such as those described previously in this section. EPA believes that this criterion—the primary activity being the generation of electric power— sufficiently clarifies and limits the scope of this rule to existing facilities whose primary business is power generation. As discussed in Section II of this preamble, the final rule does not apply to existing manufacturing facilities, including manufacturing facilities that generate power for their own use and transmit any surplus power, or sell it for transmission, provided the primary activity of the facility is not electric power generation. For

example, in the case of a facility that operates its own power generating units and such units predominantly support that facility's manufacturing operation, its primary activity remains manufacturing, even if the facility exports some power. Whether a facility's primary activity is to generate electric power will need to be determined on a case-by-case basis. Section II also makes clear that a manufacturing facility is not covered by this final rule just because it is co-located with another Phase II facility.

EPA considered specifying SIC or NAIC codes to clarify the scope of the rule beyond that proposed in § 125.91(a)(3), but did not do so because it believes the changes in the final rule are sufficient to address many issues raised in comments and because of concerns that SIC and NAIC codes may change over time, which could unintentionally alter the scope of the rule.

With regard to repowering, section II of today's notice discusses the scope of the final rule and specifically discusses the repowering issue. Section II also addresses other Phase I versus Phase II classification issues.

2. Thresholds

Some commenters supported use of the 50 MGD design intake flow threshold and the 25 percent cooling water use criteria in § 125.91(a)(2) and (4), respectively. Some suggested that facilities agreeing to limit their actual intake to less than 50 MGD should be excluded from the rule's requirements or be allowed to request an exemption. Other commenters maintained that permitted or actual

flows should be used rather than design flows. Some commenters asked that EPA clarify that, *41611 when applicable, the lesser design value of an intake facility and conveyance structure versus the design volume of intake pumps should be used to determine the 50 MGD threshold for applicability. Alternatively, others asserted that EPA should provide guidance that a facility's design intake flow is not necessarily the flow associated with that of the intake pumps.

Several commenters stated that emergency cooling water and emergency service water intakes should be exempt from the 50 MGD design intake flow threshold. These commenters recommended that EPA distinguish between primary cooling water intakes and emergency service water intakes, for example, at nuclear facilities. They reasoned that emergency service water systems, which can have a large design capacity (*i.e.*, design capacity greater than 50 MGD), generally use an intake that normally operates a nominal amount of time to ensure that the system is in working order. Such back-up systems are required for safety, but under normal conditions do not increase the operational capacity of the facility. Thus, these commenters maintain that rarely used emergency service water should not count towards 50 MGD.

With regard to the criterion that a Phase II existing facility must use at least 25 percent of the water it withdraws exclusively for cooling, some commenters indicated that proposed § 125.91(d), which describes how to measure whether 25 percent of water withdrawn is used for cooling, was ambiguous. Commenters asserted that EPA should

not require monthly determinations of applicability of the Phase II rule. One commenter suggested that EPA should assess the 25 percent cooling water use on an annual basis calculated once during permit renewal, since such an approach would provide a high degree of certainty.

As discussed in the proposed rule (67 FR 17129–17130), EPA chose the design intake flow 50 MGD threshold to focus on the largest existing power generating facilities, which the Agency believes are those with the greatest potential to cause or contribute to adverse environmental impact. EPA estimates that the 50 MGD threshold would subject approximately 543 of 902 (60 percent) of existing power generating facilities to this rule and would address 90 percent of the total flow withdrawn by existing steam electric power generating facilities. The 25 percent threshold ensures that nearly all cooling water and the most significant facilities using cooling water intake structures are addressed by these requirements. EPA notes that Phase II existing facilities, which are limited to facilities whose primary activity is power generation, typically use far more than 25 percent of the water they withdraw for cooling. Yet, as in the new facility rule, cooling water that is used in a manufacturing process either before or after it is used for cooling would not count towards calculating the percentage of a facility's intake flow that is used for cooling purposes.

EPA has retained in the final rule the 50 MGD threshold based on design intake flow, rather than actual flow, for several reasons. Design intake flow is a fixed value based on the design of the facility's

operating system and the capacity of the circulating and other water intake pumps employed at the facility. This approach provides clarity—the design intake flow does not change, except in those limited circumstances when a facility undergoes major modifications or expansion, whereas actual flows can vary significantly over sometimes short periods of time. EPA believes that an uncertain regulatory status is undesirable because it impedes both compliance by the permittee and regulatory oversight, as well as achievement of the overall environmental objectives. Further, using actual flow may result in the NPDES permit being more intrusive to facility operation than necessary since facility flow would be a permit condition and adjustments to flow would have to be permissible under such conditions and applicable NPDES procedures. It also would require additional monitoring to confirm a facility's status, which imposes additional costs and information collection burdens, and it would require additional compliance monitoring and inspection methods and evaluation criteria, focusing on operational aspects of a facility.

With regard to intake versus pump capacity, EPA notes that under § 125.93 of the final rule, design intake flow means the value assigned (during the cooling water intake structure design) to the total volume of water withdrawn from a source waterbody over a specific time period. Because numerous aspects of a cooling water intake or system can limit a facility's intake flow, and because flow is a critical factor that affects the impacts posed by each facility's cooling water intake structures, EPA has determined that it is more appropriate for the final rule to focus on a facility's total designed volume of water

withdrawn over a period of time, rather than to condition applicability of the rule on more specific parameters, such as intake capacity or pump design, which individually do not fully determine total design intake flow.

The final rule does not explicitly exclude emergency cooling water and emergency service water intakes from consideration in determining which facilities are in-scope. Although EPA does not have detailed data on emergency cooling water and emergency intakes, based on other available data EPA does not believe that including consideration of emergency intakes within this rule significantly alters the scope of the rule. EPA's survey of all existing electric utilities and non-utilities indicated that 84 percent of surveyed facilities have an average flow that equals or exceeds 50 MGD. These facilities would by necessity have a design intake flow that also equals or exceeds 50 MGD. Moreover, EPA assumes that this average flow data represent normal operating conditions and does not include emergency cooling water use. Consequently, EPA believes that relatively few facilities are potentially affected by this issue.

Finally, § 125.91(a)(4), which describes how a facility must determine whether it meets the 25 percent cooling water use criterion has been changed in the final rule and provides that the percent of cooling water used be measured on an average annual basis. EPA believes this approach is more appropriate than making this determination on an average monthly basis, primarily because the annual average is an easier measurement to make. Furthermore, because all Phase II existing facilities

generate power, most of the water will be used for cooling, rendering monthly evaluation of this value unnecessary. The final rule does not specify how often the facility must measure flow for this annual average. The facility is encouraged to consult the Permit Director to determine what level of data collection is needed.

B. Environmental Impact Associated With Cooling Water Intake Structures

Many comments addressed adverse environmental impact, questioning the definition and quantification of adverse environmental impacts. Several suggested defining adverse environmental impact exclusively at the population, community, or ecosystem levels, and believe that numbers of impinged and entrained organisms should not be a measure of adverse environmental impact. Some commenters argued that, if a facility can prove it does not cause adverse environmental impact at the population level, then it should be exempt from section 316(b) regulations. Commenters **[*41612]** cited numerous studies to illustrate whether cooling water intake structures cause adverse environmental impacts and claimed that where abundance or biomass falls, it was usually the result of some other stressor (overfishing, pollution, etc). These commenters asserted that populations are able to thrive despite high rates of impingement and entrainment because of density-dependence and compensation.

Numerous other commenters disagreed with limiting the definition of adverse environmental impact to the population, community or ecosystem levels, and contended that any measure of

impingement and entrainment constitutes adverse environmental impact. They asserted that power plants contribute to fish kills directly by impingement and entrainment, and indirectly by habitat loss. These commenters maintained that the results of population or ecosystem studies are highly subjective, and have no place in determining BTA, as once such impact levels are reached, recovery is often impossible. Regardless of the severity of adverse environmental impact, these commenters argued that section 316(b) requires minimization of adverse environmental impact. They maintained that cooling water intake structures contribute to fishery collapse and vast reductions in fish biomass and abundance that are measurable at the species level. These commenters suggested that actual national impacts due to cooling water intake structures are vastly underestimated due to poor data collection methodologies utilized when the majority of the studies were performed and because studies performed on impinged and entrained organisms overlooked the vast majority of affected species.

In today's final rule, EPA has elected not to define adverse environmental impact. EPA believes that it is reasonable to interpret adverse environmental impact as the loss of aquatic organisms due to impingement and entrainment. For a further discussion of this issue, see Section IV above.

With regard to the relationship between intake flow and adverse environmental impact, some commenters asserted that the relationship of impingement and entrainment to flow is such that catch rates increase non-linearly (exponentially) in relation to the volume of water withdrawn, with

entrainment rates being more strongly correlated to flow than impingement. Environmental commenters advocated for flow reduction technologies, such as retrofitting closed-cycle cooling technologies, as the most direct means of reducing fish kills from power plant intakes; they assert that reducing intake by up to 98 to 99 percent would result in a similarly high reduction of impinged and entrained organisms. Other commenters insisted that there is no statistically significant relationship between catch rate and flow, and the mathematical models that evaluate this relationship are inaccurate.

EPA believes the record contains ample evidence to support the proposition that entrainment is related to flow (see DCN 2-013L-R15 and 2-013J) while impingement is related to a combination of flow, intake velocity and fish swim speed (see DCN 2-029). Larger withdrawals of water may result in commensurately greater levels of entrainment. Entrainment impacts of cooling water intake structures are closely linked to the amount of water passing through the intake structure because the eggs and larvae of some aquatic species are free-floating and may be drawn with the flow of cooling water into an intake structure. Swim speeds of affected species as well as intake velocity must be taken into account to predict rates of impingement in relation to flow in order to account for the ability of juvenile and adult lifestages of species to avoid impingement. Due to this relationship, EPA agrees that reducing intake by installing flow reduction technologies will result in a similarly high reduction of impinged and entrained organisms, but EPA believes that other technologies that do not necessarily reduce flow but that do reduce the

number of aquatic organisms impinged and entrained will also minimize adverse environmental impact associated with cooling water intake structures. As such, today's rule provides for flexibility in meeting the performance standards.

C. Performance Standards

The performance standards promulgated today are expressed as reductions of impingement and entrainment measured against a calculation baseline. The purpose of a calculation baseline is to properly credit facilities that have installed control technologies prior to the promulgation of the rule. EPA received numerous comments on the performance standards and the calculation baseline.

1. Appropriate Standards

Many commenters discussed the appropriateness of the performance standards. While many commenters acknowledged that the performance range may be attained at some facilities (using certain technologies and in appropriate conditions), several commenters stated that the technical justification for the performance standards was insufficient and may be biased towards higher performing examples of each technology. Many commenters submitted that some technologies will perform at some sites, but that no technology will meet the standards at all sites. Another commenter supported the concept of the performance standards, as long as sufficient flexibility was retained through the use of restoration measures and cost tests. Some commenters suggested allowing permit writers the flexibility to create site-specific performance standards.

EPA has selected performance standards to facilitate a more streamlined permitting process, and to provide consistent national standards. EPA has chosen to express the targets by reference to a percentage reduction in impingement and entrainment because, as discussed above, these losses can easily be traced to cooling water intake structures. Therefore, this is a convenient indicator of the efficacy of controls in reducing environmental impact. As discussed in more detail below, it is also a useful basis against which to consider the efficacy of restoration technologies, which focus on the replacement of fish and shellfish as an alternative means of minimizing adverse environmental impact of intake structures.

Additional documentation has been collected and reviewed by EPA to further support the percent reductions contained in the performance standards. EPA has added this information to the Technology Efficacy database (DCN 6-5000), which EPA has expanded to allow users to query and compare basic data on technology performance and applicability. EPA recognizes that some may disagree with basing the performance standards on the wide range of data available in the database. While many documents do show a level of success in reducing impingement mortality or entrainment, other studies have shown the deployed technology to be unsuccessful or at best inconclusive. EPA does not view the varying degrees of success with regards to a specific technology as indicative that the performance standards cannot be met, but rather as evidence that some technologies work in some applications but not in others.

It is for this reason that performance standards, rather than prescriptive technologies, were chosen. By opting for performance standards instead of requiring the deployment of specified technologies, EPA maintains a desired **[*41613]** flexibility in the implementation of the rule, thus allowing a facility to select measures that are appropriate to the site conditions and facility configuration. EPA believes that there are technologies available (including restoration measures) that can be used to meet the performance standards at the majority of facilities subject to the final Phase II rule. EPA believes that it will likely be the exceptional case where no technology or suite of technologies will be able to achieve the performance standards. This is not to say, however, that the technologies are always economically practicable to implement; there may be situations where the costs are not justified and it is for those situations that EPA has provided for site-specific determinations of best available technology for minimizing adverse environmental impact.

2. Application of the Performance Standards

Commenters generally noted that the application of the performance standards would be very difficult, for a number of site-specific reasons. Several commenters noted that the performance standards are not sufficiently defined to make a full evaluation of their applicability. For example, EPA has not defined the performance standards as being measured using all species or selected species, or by counting individuals versus measuring biomass. Some commenters noted that each of the methods discussed by EPA could have merit at a given facility, and that flexibility would be needed to

evaluate compliance at a variety of intake configurations. Another commenter further noted that it is inappropriate for EPA to state that the performance standards are achievable when the standards are undefined. One commenter suggested that EPA has not shown that the performance standards can be met at a reasonable cost. Other commenters stated that reductions may be achievable for only some species of life stages and that this approach may not account for natural fluctuations in population. These commenters claim that implementing a uniform, nationwide performance standard would be exceedingly complex and subject to site-specific factors that could significantly affect the performance of the control technology. Several commenters noted that, for these reasons, EPA should strongly consider a site-specific approach to implement 316(b), including a risk assessment-based approach as suggested by one commenter.

A number of commenters stated that the performance standards would be best implemented as a set of goals or as a best management practice. These commenters contended that in view of the wide variety of environmental conditions at facilities, including natural fluctuations in populations, compliance with a national performance standard will be difficult. They claimed that by using the standards as a goal instead of a condition in the permit, a facility can have greater certainty as to its compliance status. Similarly, several commenters suggested that the permit contain conditions requiring proper technology selection, installation, maintenance, and adjustments instead of requiring compliance with the performance standards.

Commenters were divided over the concept of a range for the performance standards. Some commenters supported the range, arguing that a facility can achieve some reduction within the range and still be compliant, and others were opposed, claiming that a range of performance promotes uncertainty in determining compliance. Some commenters also noted that, by giving a facility a range of performance, EPA is encouraging performance in the lower end of the range and therefore not meeting the definition of "best technology available."

Several commenters noted that consideration of entrainment mortality is important to correctly determine compliance. One commenter also noted that natural events will affect compliance, such as moribund fish being swept into an intake or heavy debris loads following a storm.

As in the Phase I rule, EPA is setting performance standards for minimizing adverse environmental impact based on a conceptually simple and certain metric-reduction of impingement mortality and entrainment. EPA recognizes however, that there are challenges associated with measuring such reduction due to fluctuations in waterbody conditions (species abundance, composition, etc.) over time. While it is relatively straightforward to measure impingement mortality and entrainment reductions relative to past levels, it is more difficult to determine reductions relative to what would have occurred in the absence of control technologies if waterbody conditions change after the technologies are installed. Data provided with the proposed rule (DCN 4-0003) indicate that there is substantial

variability over time in the numbers and species mix of impinged and entrained organisms at any given facility. While changes in operational practices and sampling methods account for some of this variability, the data indicate that there may be substantial natural variability in waterbody conditions as well. This natural variability and the changes to species composition over time may affect the ability of these technologies to perform consistently at a certain level. This is one reason why EPA has provided a compliance determination alternative under which facilities comply with the construction, operational, maintenance, monitoring, and adaptive management requirements of a Technology Installation and Operation Plan (or Restoration Plan) designed to meet the performance standards, rather than having to demonstrate quantitatively that they are consistently meeting them, which may be difficult in the face of natural variability. Under this approach, if monitoring data suggest that performance standards are not being met despite full compliance with the terms of the Technology Installation and Operations Plan or the Restoration Plan, the Plan will need to be adjusted to improve performance.

EPA has provided examples of facilities in different areas of the country sited on different waterbody types that are currently meeting or exceeding the performance standards promulgated today. The ability of these facilities to attain similar performance standards suggests that while site-specific factors can influence the performance of a given technology, it is the exceptional situation where no design or construction technology is capable of meeting the performance standards. EPA

opted for performance ranges instead of specific compliance thresholds to allow both the permittee and the permitting authority a certain degree of flexibility in meeting the obligations under the final Phase II rule. EPA does not believe that performance ranges promote uncertainty. Instead, EPA has selected performance ranges out of the recognition that precise results may not be able to be replicated in different waterbody types in different areas of the country. EPA disagrees with the comment that it has not shown that the performance standards can be met at a reasonable cost. The cost and economic impact analysis for the final rule supports EPA's determination that the final rule, including the performance standards, are economically practicable at a national level. In addition, the final rule includes a site-specific compliance alternative to address any potential situation where meeting the performance standards, when evaluated on a facility-specific basis, would result in costs that are significantly greater than the costs **[*41614]** considered by EPA, for a like facility in establishing the standards, or that are significantly greater than the benefits of compliance with the applicable performance standards at the facility. Thus, the final rule ensures that the costs of the rule are economically practicable to the extent required by section 316(b).

In developing the final rule, EPA identified and examined a broad range of cooling water intake structure technologies and determined, at a national level, that these technologies support the final performance standards. EPA notes that, although the performance standards address all life stages of fish and shellfish, the Director has significant

discretion as to how the performance standards are applied in the permit. For example, the Director may determine that all species must be considered or that only representative species are to be considered. With regard to natural fluctuations in fish and shellfish populations, and the Technology Installation and Operation Plan compliance scheme discussed above addresses the concern that natural fluctuations could impact the level of impingement mortality and entrainment at a given facility over time. Further, the Director is given considerable discretion to determine, based on the facility's Comprehensive Demonstration Study, the appropriate averaging period and precise metric for determining impingement mortality and entrainment reductions. Generally, averaging over longer time periods (*i.e.*, a full five year permit term) can substantially reduce the impact of natural variability on the determination of whether the performance standards are being met.

3. Requirements by Waterbody Type

As stated in section C. 2, different performance standards would apply for facilities located upon different waterbody types. Comments were received both in support of and against basing performance standards in part on waterbody type. Some commenters did not support the withdrawal threshold of 5 percent of the mean annual flow for facilities on freshwater rivers, as the organisms at an intake may not be subject to entrainment or may not be evenly distributed. Some State commenters supported the withdrawal threshold for freshwater rivers, and another suggested correlating the intake flow requirements with the total flow of the

waterbody to better protect smaller flow rivers. One State commenter generally opposed all of the proposed thresholds on freshwater rivers as being arbitrary and stated that the regulations would be more effective by considering the impacts to the population within the waterbody. For lakes and reservoirs, one commenter opposed the requirement to not disturb the thermal stratification of the waterbody, stating that the requirement has not been defined in sufficient detail, that EPA has presented no evidence that the disruption is always detrimental, or presented any discussion of technologies that might mitigate any thermal disturbances. Some commenters did not support additional controls on the Great Lakes, stating that the Lakes are not unique and do not require greater protection. Another State commenter suggested that additional requirements be implemented for any impaired waterbody.

EPA considers location to be an important factor in addressing adverse environmental impact and one expressly included in the language of section 316(b). When cooling water is withdrawn from sensitive biological areas, there is a heightened potential for adverse environmental impact, since these areas typically have higher concentrations of impingeable and entrainable aquatic organisms. Therefore, the final rule includes performance standards that vary, in part, by waterbody type. For example, estuaries and tidal rivers have a higher potential for adverse impact because they contain essential habitat and nursery areas for a majority of commercial and recreational species of fish and shellfish. Therefore, EPA believes that these areas warrant a higher level

of control that includes both impingement and entrainment controls.

EPA also included performance standards for other waterbody types. Facilities withdrawing greater than 5% of the mean annual flow from freshwater rivers and streams will have additional requirements. As described in the Phase I proposed rule (65 FR 49060) and the Phase II NODA (66 FR 28853), the withdrawal threshold is based on the concept that absent any other controls, withdrawal of a unit volume of water from a waterbody will result in the entrainment of an equivalent unit of aquatic life (such as eggs and larval organisms) suspended in that volume of the water column. Thus, facilities withdrawing greater than 5% of the mean annual flow from freshwater rivers and streams may entrain equal proportions of aquatic organisms. Freshwater rivers and streams are somewhat less susceptible to entrainment than certain other categories of waterbodies and, therefore, the final rule limits the requirement for entrainment control in fresh waters to those facilities that withdraw the largest proportion of water from freshwater rivers or streams. EPA has promulgated special requirements for facilities withdrawing from lakes and reservoirs. Facilities tend to withdraw from the deeper portions of lakes and reservoirs, as these areas hold the coolest water. The rule specifies that the intake flows must not disturb the natural stratification (thermoclines) in the waterbody, as this may disrupt the composition of dissolved oxygen and adversely affect aquatic species. While such disruption is often detrimental, this additional performance standard does not apply where the disruption does not adversely affect the management of fisheries. Intake

location, the volume of water withdrawn, and other design technologies can be used to address this requirement. Facilities located on the Great Lakes are also subject to additional requirements because these waterbodies have areas of high productivity and sensitive habitat and in this respect have an ecological significance akin to estuaries.

4. Approved Design and Construction Technology Option

In response to comments on the burden to facilities and permit writers, EPA is including in the final rule an approved design and construction technology option (previously referred to as a "streamlined technology option" or "pre-approved technology option") for facilities in certain locations. Under this option, a facility installing a specified technology would be subject to reduced application requirements, including a reduced Comprehensive Demonstration Study. In addition, the final rule sets forth criteria that State Directors may use to identify and approve additional technologies.

Nearly all commenters supported the concept of an approved design and construction technology option as a positive step in facilitating implementation of section 316(b). Several commenters added that this option should not preclude the use of cost tests, restoration measures or the use of other approaches. One commenter opposed the approved design and construction technology option, arguing that the selection of only one or two technologies oversimplifies the complexity of waterbodies, and that the approach would not be sufficiently protective.

Some commenters agreed that the wedgewire screen should be an effective technology in certain situations and noted that EPA should specify screen slot openings in the approved design **[*41615]** and construction technology option. One of the commenters stated that research on the wedgewire screen suggests that the technology should easily meet the impingement requirements, but that further research may be necessary to confirm the effectiveness for entrainment reductions with varying slot openings.

Some commenters offered suggestions for additional changes to the option, such as developing scientifically sound, peer-reviewed criteria for evaluating pre-approved technologies, identifying the technologies in technical guidance documents as opposed to the regulation, and continuing to allow restoration measures. Some commenters also suggested specifying that any monitoring performed would be informational in nature and not affect the facility's compliance status, or that facilities only be required to "substantially meet" the stated goals. Other commenters suggested expanding the scope of the approved design and construction technology option to include prescribed operational or restoration measures or preapproved technologies for intakes located on man-made cooling reservoirs.

A facility that chooses to comply under the pre-approved technology option should not, in addition, need to employ restoration measures. The intent of the pre-approved technology compliance alternative is to provide a means to reduce the application and information collection requirements for facilities that are able to meet performance standards through a

technology that is proven to meet performance standards for impingement mortality and entrainment in most cases. A facility that chooses to comply by meeting the conditions specified at § 125.99(a), therefore, should be able to achieve the performance standards for both impingement mortality and entrainment. Facilities that propose an alternative technology for consideration as a pre-approved technology under § 125.99(b) are encouraged by EPA to propose technologies to the Director for approval that are capable of meeting performance standards for both impingement mortality and entrainment with a high degree of confidence. However, a situation could arise where a pre-approved technology only meets performance standards for impingement mortality or entrainment. In such cases, facilities that choose to comply using an approved design and construction technology that only met a subset of applicable performance standards could either employ other (1) design and construction technologies, operational measures and/or restoration measures or (2) request a site-specific requirements for the remaining performance standards based on either the cost-cost or cost-benefit test.

Some commenters stated that EPA should specify the wedgewire screen slot opening size. EPA disagrees that it should specify a uniform screen slot opening size for all facilities that choose the approved design and construction technology alternative. The rule states in § 125.99(a)(1)(iv) that the screen slot size must be appropriate for the size of eggs, larvae, and juveniles of all fish and shellfish to be protected from entrainment at the site. Because the species to be protected differ among

locations, the slot sizes will need to be tailored to the sizes of the various assemblages of species at each site. EPA therefore has determined that the Director should determine the appropriate design criteria, such as wedgewire screen slot opening size, on a case-by-case basis. Since no impingement mortality and entrainment Characterization Study is required under this streamlined option, EPA expects that this determination would be based on available information regarding species and life-stage composition of organisms within the receiving waterbodies. Facilities may wish to assemble available data and propose a screen slot opening size for the Director's consideration.

Some commenters stated that EPA should develop peer-reviewed criteria for evaluating pre-approved technologies other than the wedgewire screen technology described in § 125.99(a). EPA disagrees that it needs to develop specific criteria for evaluating pre-approved technologies. EPA believes that the Director is best equipped to determine the most appropriate technologies for approval in their jurisdictions, since these Directors are most familiar with the site-conditions and intake configurations of the facilities within their jurisdictions, and have physical access to the facilities. Under § 125.99, EPA has set forth a broad framework outlining the types of information that the permitting authority would need to evaluate specific technologies, including design criteria of the proposed technology, site characteristics and conditions necessary to ensure that the technology will meet the performance standards, and data to demonstrate that the facilities in the Director's jurisdiction with the proposed technology and site conditions will be able

to meet the performance standards in § 125.94(b). EPA believes that the Directors will be able to evaluate the data and make determinations as to whether the proposed technologies are suitable for use as approved design and construction technologies in their jurisdictions. However, EPA is requiring that the Director take public comment on such determinations prior to finalizing them.

In answer to comments that EPA should not require facilities choosing the approved design and construction compliance alternative to demonstrate through monitoring that they meet the applicable performance standards, EPA disagrees. EPA believes that verification monitoring is very important because, while the pre-approved technologies are designed to meet the performance standards in most cases, the actual efficacy of any technology will be affected by site-specific circumstances and conditions, as well as proper operation and maintenance of the technology. For this reason, EPA believes that it is necessary and appropriate for these facilities to prepare a Technology Installation and Operation Plan that describes how they will operate and maintain the technology and assess success in meeting the performance standards, as well as adaptive management steps they will take if the technology does not perform as expected. They must also propose a Verification Monitoring Plan to describe the monitoring they will perform to support their performance assessment. EPA notes that facilities that select the approved technology alternative have significantly reduced application and information collection requirements relative to facilities that comply under other alternatives.

One commenter stated that the approved design and construction technology alternative will not be sufficiently protective given the complexity of waterbodies. While EPA does not agree with this comment, EPA recognizes that the efficacy of a given technology will be affected by site-specific conditions, such as biological and chemical factors in the waterbody. Because the efficacy of the technology will be affected by such site-specific conditions, EPA has required all facilities that choose to comply using the approved design and construction technology compliance alternative to submit a Technology Installation and Operation Plan and a Verification Monitoring Plan, and to determine if they are meeting the applicable performance standards through monitoring, and adjust their operations accordingly if they are not. EPA believes, based upon extensive research, that the majority of facilities with the appropriate site conditions, and that have installed and properly operated **[*41616]** and maintained submerged cylindrical wedgewire screen technology, should be capable of meeting the performance standards set forth in . For facilities that fail to meet performance standards through the approved design and technology alternative, the Director may amend the facility's permit to require the use of additional design and construction technologies, operational measures, and/or restoration measures, in order to meet the performance standards, or if appropriate, issue a site-specific determination of BTA.

5. Capacity Utilization Threshold

In the proposed rule, EPA introduced reduced requirements for facilities that are typically not

operating year-round and would therefore bear a proportionately higher cost to comply with the rule. EPA proposed that facilities that operate less than 15% of the time (also known as peaking facilities) would only be subject to impingement reductions, regardless of the waterbody type upon which the facility is located.

Generally, commenters supported the concept of reduced requirements for peaking facilities. However, commenters stated that EPA must further refine the definition of peaking facilities and in many cases suggested that EPA adopt the United States Department of Energy's definition of capacity utilization. Aspects of EPA's definition on which commenters requested clarification included how to measure the capacity rate (per intake, per facility, per generating unit, etc.), the time frame for determining historic utilization rates, and the definition of "available" with respect to how to calculate the capacity utilization rate. One commenter further suggested that EPA allow an expanded definition (*i.e.*, a higher capacity utilization rate) for facilities that typically operate in periods of low abundance of entrainable organisms. One commenter further requested that the reduced requirements for peaking facilities be extended to account for future operations at the plant as well. Another commenter expressed concern over the definition of the threshold, as the operational time for the facility could still coincide with periods of high abundances of organisms and therefore still result in significant entrainment. One commenter opposed the threshold, stating it could encourage facilities to reduce electricity production in order to have less stringent requirements and therefore

impact energy production, prices, and energy supply nationwide.

State commenters generally supported the concept, but were divided as to the threshold utilization rate; some States preferred a lower threshold and one mentioned that it would prefer a higher threshold. One State did not support the reduced requirements for peaking facilities, noting that the time frame in which the facility operates may be more important than the volume withdrawn. Another State suggested that restoration or mitigation also be required of peaking facilities.

EPA has identified peaking facilities in the final Phase II rule as those facilities that operate at an overall capacity of less than 15 percent. EPA believes that facilities operating below 15% should be subject to less stringent compliance requirements relative to a typical base load facility. The threshold of 15% is based on these facilities' reduced operating levels, low potential for entrainment impacts, and consideration of economic practicability (see, 67 FR 17141). To address commenter concerns, EPA has modified the capacity utilization definition to say that the capacity utilization rate applies only to that portion of the facility that generates electricity for transmission or sale using a thermal cycle employing the steam water system as the thermodynamic medium. The Agency has amended the definition of the capacity utilization rate threshold to remove the term "available" from the definition, as requested by comments. Further, the Agency has allowed for calculation of the capacity utilization rate on an intake basis, when the intake is exclusively dedicated to a subset of the plant's generating units,

and for determination of the capacity utilization rate based on a binding commitment of future operation below the threshold.

Peaking facilities are typically older, less efficient generating units. Because the cost of operation is higher, peaking facilities are generally employed when generating demand is greatest and economic conditions justify their use. Such usage is typically a fraction of the unit's overall generating capacity and represents significantly less cooling water used when compared to the design intake capacity. This would appear to obviate the need for entrainment controls for the facility.

Most peaking facilities are employed during the highest electrical demand period, typically mid-winter or mid-summer. It is generally accepted that while these seasons can sometimes be associated with a higher abundance of aquatic organisms or spawning events, mid-winter and mid-summer are not typically considered to be critical periods for aquatic communities. Given these operating conditions, generally entrainment controls would appear to be an unnecessary cost for these facilities because the losses, while they occur, would have minimal adverse environmental impact.

D. Site-Specific Approach

Past implementation of section 316(b) often followed the draft guidance document published in 1977, which promoted a largely site-specific approach. In this rulemaking, EPA is establishing national performance standards for best technology available for minimizing adverse environmental impacts in connection with cooling water intake

structures. Many comments were received regarding a site-specific approach to implementation.

1. Approach

Many commenters favored a site-specific approach in place of national performance standards. Many of the commenters cited a need for flexibility to comply with the regulations, and stated that only a site-specific approach can represent the best framework for addressing site-specific environmental impacts in a cost-effective manner. Commenters also favored an approach that resembles current practices for implementation of 316(b), in which site-specific determinations are made without reference to national performance standards.

Some commenters did not support the concept of a site-specific rule. One commenter stated that it does not fulfill a national standard and allows a more lenient application for some facilities. Another commenter added that a site-specific approach favors industry, as the resources of the regulators and interested public groups to respond to information-intensive site-specific determinations are limited. Some States also expressed concern over a site-specific approach, as it could be less stringent than the present approach, as well as more burdensome. Some other States expressed support for site-specific approaches.

In the final rule, EPA has established national performance requirements for the reduction of impingement mortality and entrainment that reflect best technology available to minimize adverse environmental impact for Phase II existing facilities, and has authorized five different compliance

alternatives to achieve those standards, including a site-specific alternative. Thus, the Agency has provided both clear national standards of environmental protection and sufficient flexibility to allow for the selection of cost-efficient approaches to compliance and permit administration. In addition, under certain compliance alternatives, Phase II existing facilities **[*41617]** can use restoration measures, either in lieu of, or in combination with technologies and/or operational measures, when design and construction and/or operational measures alone are less feasible, less cost-effective or less environmentally desirable. This provides additional flexibility to permittees and permitting agencies. Finally, as discussed in Section VII of this preamble, EPA does not agree that all aspects of certain site-specific approaches effectively fulfill the requirements of section 316(b).

2. Existing Programs and Determinations

Several commenters stated that there is already a successful 30-year history of implementing section 316(b). Some commenters noted that many States currently implement 316(b) using a site-specific approach and that these programs should be allowed to continue, including any restoration or enhancement programs the States have established. Others stated that existing BTA determinations (conducted using a site-specific approach) should remain valid.

EPA acknowledges that some States' existing programs and determinations have been successful in reducing adverse environmental impacts to waters of the United States associated with cooling water intake structures. EPA disagrees, however, that all

existing BTA determinations should remain valid. Some historical BTA decisions may be based on physical, chemical or biological conditions that are no longer relevant at the site, or reflect BTA technology that is outdated and would not meet the performance standards set forth in today's final rule. However, the final rule provides for EPA approval of alternative State program requirements where such State NPDES requirements will result in environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under § 125.94. (*see* § 125.90(c)). Thus, this rule provides a reasonable degree of flexibility for States to implement existing effective programs. In § 125.94(e), States are also allowed to establish more stringent BTA requirements if necessary to comply with State, tribal, or other federal law.

E. Implementation

1. Calculation Baseline

Numerous commenters indicated that they were unclear as to how to calculate the baseline conditions for impingement mortality and entrainment. Some commenters suggested that the calculation baseline should reflect unrestricted operation at full design capacity year-round to avoid continually changing the baseline, since maintenance and operational schedules change over time. Another commenter added that the baseline definition must specify that data be based upon maximum operation of a given facility, to avoid allowing a facility to withdraw more water than it has been permitted for (based on an averaged flow). Other commenters claimed that the use of a calculation baseline was problematic due to

the difficulties of extrapolation between localities and waterbody types. One commenter asserted that the calculation baseline should reflect current local environmental conditions, not historical or hypothetical future conditions and should specify the level of operation that would be maintained in the absence of operational controls implemented for reducing impingement and entrainment.

Many commenters supported an "As Built" alternative approach where a facility would calculate entrainment reduction based on historical measurements before installation of new technology or sampling immediately in front of the new technology and enumerating the organisms of a size that will pass through a standard 3/8-inch screen. Several commenters agreed that the use of historical data would aid in estimating the calculation baseline while others cautioned against the use of historical data that may not be relevant to the current conditions. One commenter disagreed with EPA's statement that the baseline could be estimated by evaluating existing data from a nearby facility; the commenter asserted that site-specific factors determine whether an organism will interact with a cooling water intake structure and/or survive the interaction. Overall, most commenters recommended that EPA allow the Director broad discretion and flexibility in evaluating the calculation baseline due to varying site conditions.

The calculation baseline provides a standard intake configuration by which facilities can determine relative reductions in impingement and entrainment. EPA acknowledges the numerous comments on the proposed definition and has refined

the definition to provide more clarity in implementing this concept. For example, the definition in the proposed rule incorporated a shoreline intake structure. In the final rule, the definition has been clarified to specify a 3/8 -inch mesh traveling screen at a shoreline intake structure. Based on available data that indicate this is a common intake structure configuration at Phase II existing facilities, EPA designated a 3/8-inch screen as the standard mesh size against which reductions will be calculated. Similarly, the assumption of no impingement or entrainment controls in the definition in the proposed rule has been clarified to describe an intake where the baseline operations do not take into include any procedures or technologies to reduce impingement or entrainment. EPA recognizes that some facilities may have control technologies in place that already reduce impingement or entrainment; the final calculation baseline would allow credit for such reductions. Additionally, EPA further clarified the definition to include the potential data sources that may be used in defining the calculation baseline, such as historical data, data collected at nearby locations, or data collected at the facility. EPA is authorizing the use of existing biological data in determining the calculation baseline to minimize the impacts to facilities, provided that the data are representative of current facility and/or waterbody conditions (as applicable) and were collected using appropriate quality control procedures.

EPA has further clarified the definition to provide that the calculation baseline may be based on an intake structure located at a depth other than a surface intake if the facility can demonstrate that

the standard definition (*i.e.*, a shoreline surface intake) would correspond to a higher baseline level of impingement mortality and/or entrainment.

EPA chose not to incorporate operating capacity into the calculation baseline, as the definition is not dependent upon intake flow volumes. EPA has chosen to adopt the "as built" approach: as stated in § 125.93, a facility may choose to use the current level of impingement mortality and entrainment as the calculation baseline.

EPA recognizes that this definition cannot address the variety of intake configurations and other conditions at all facilities and therefore cannot define the calculation baseline in all settings. However, EPA believes that the calculation baseline in the final rule is clear and straightforward to implement, and allows for proactive facilities (*i.e.*, those with control technologies, operational procedures, or restoration measures already in place) to take credit for existing measures.

2. How Will Attainment of the Standards Be Measured?

At the time of the NODA, EPA was evaluating several approaches for **[*41618]** measuring success in meeting performance standards. EPA therefore requested comments on whether performance should be measured based on an assessment of the impacts to all fish and shellfish species ("all-species approach") or to fish and shellfish from only a subset of species determined to be representative of all the species that have the potential to be impinged or entrained ("representative species approach"). These comments are addressed under . a below. Several

terms to describe the representative species approach have been used historically. To avoid confusion among the terms "representative indicator species," "representative important species," and "critical aquatic organisms," EPA is adopting the term "representative species" for the purpose of simplicity in this section. EPA also requested comment as to whether enumeration of organisms or biomass should be used as the metric for measuring success in meeting the performance standards. These comments are addressed in . b below. With regard to counting absolute numbers of organisms, EPA also requested comment on the option of counting undifferentiated organisms (*i.e.*, counting without specifying taxonomic identification).

After attempting to select optimal approaches for both the scope and metric to use in determining attainment of the performance standards, EPA has determined site-specific factors such as biological assemblage at the site, intake location, and waterbody type must be factored into decisions regarding how to evaluate attainment. EPA has therefore decided that, in its Verification Monitoring Plan (125.95(b)(7)), the facility must propose, among other things, the parameters to be monitored for determining attainment. The Director will be best suited to review and approve proposed parameters for each facility on a case-by-case basis.

a. Scope of Evaluation: All-Species Consideration vs. Representative Species

Several commenters supported the use of a representative species evaluation, as opposed to the all-species evaluation, as the most practical approach in many cases. Another commenter stated that even

with the representative species approach, factors other than simply numeric reduction in impingement mortality and entrainment must be considered when determining attainment. On the other hand, one commenter stated that an "all species" approach could make compliance demonstrations simpler and somewhat less expensive so long as the taxonomic identity of collected organisms is not required. The commenter noted that this would not be appropriate, however, in cases where taxonomic identification is needed, such as where eggs and larval stages are converted to age-1 equivalents.

As part of the representative species inquiry, EPA also requested comment on whether 10 to 15 species might be an appropriate number of representative species to protect all species and ecosystem functions at a facility. One commenter responded, stating that 15 was too large a number. This commenter suggested that a demonstration should focus on the four or five species and add to the list only if there was another species of special concern.

In response to the commenter who suggested that EPA should evaluate factors other than reduction in numbers of organisms impinged or entrained, EPA has selected several means by which to determine compliance with section 316(b) requirements. For facilities that choose to demonstrate compliance with the performance standards, the metric that will be used to evaluate compliance with the performance standards is the facility's reduction of impingement mortality and entrainment through the installation of design and control technologies and/or operational measures. For these facilities, compliance may then be measured against a facility's calculation baseline.

which the facility estimates and submits with its permit application package. The calculation baseline is defined at § 125.93. For facilities that choose to use compliance with the terms of a Technology Installation and Operation Plan or Restoration Plan to determine compliance, the degree of success in meeting performance standards is still an important criteria for determining if adaptive management is needed, but it would not be the basis for determining compliance. For facilities that choose to use restoration measures, attainment of performance standards will be based upon whether the production of fish and shellfish from the restoration measures is substantially similar to the level of fish and shellfish the facility would achieve by meeting the applicable impingement and/or entrainment requirements. If a facility has been approved for a site-specific determination of best technology available, the Director will establish alternate requirements accordingly. EPA expects that a variety of factors will be considered in determining the appropriate compliance option for a facility, such as waterbody type, intake location, percentage withdrawal of mean annual flow of rivers or streams, capacity to upset thermal stratification in lakes, a facility's calculation baseline, and the appropriateness of existing or proposed protective technologies or measures.

EPA agrees that a single approach may not be optimal in all cases. The Agency has therefore not prescribed the methods (including a metric) for assessing success in meeting performance standards in today's final rule. Rather, the Director must determine whether a clearly defined all-species approach or representative species approach is appropriate on a case-by case basis, based upon the

information and proposed methods presented by the facility. The Director may choose to require evaluation of all species or of certain representative species.

In response to comments regarding EPA's suggested number of representative species, the facility will propose the number of species to monitor, as well as decisions regarding species and life stages to monitor, for review and approval by the Director as part of Verification Monitoring Plan (125.95(b)(7)), Technology Installation and Operation Plan (125.95(b)(4)(ii)), and, if applicable, the Restoration Plan required at 125.95(b)(5). As such, in cases where the representative species approach is applied, the Director may approve the number of representative species proposed by the facility, based upon the specifics of the waterbody from which the facility is withdrawing, the percentage volume of water withdrawn relative to the freshwater river or stream (as applicable), and other factors.

b. Metric: Absolute Counts vs. Biomass

EPA requested comment as to whether species impinged or entrained may be measured by counting the total number of individual fish and shellfish, or by weighing the total wet or dry biomass of the organisms. In response to the use of absolute counts of organisms or biomass (weight) for determining compliance, commenters offered a variety of views. Regarding the use of biomass as a metric, one commenter expressed that measuring either biomass or total undifferentiated numbers of species would be appropriate for cases where restoration was the chosen option, since restoration will never result in one-for-one species compensation. Several

commenters pointed out a disadvantage of counting numbers of organisms: early life stages will dominate the numbers and thereby dominate the compliance *41619 determination, even though most of them would have suffered large natural mortality losses even without entrainment. To correct for this, a few commenters suggested identifying the organisms and converting them to an equivalent unit to ensure that each life stage is appropriately weighed. Specifically, one commenter suggested converting to equivalent juveniles, when measuring organisms by biomass, to correct for the fact that the count will be dominated by later larval stages even though the number of these organisms per unit weight will be small compared to eggs and larvae. This commenter continued that this approach would be useful for forage species, since biomass is an appropriate measure of the organisms that serve as a food source for commercial and recreational species.

EPA received many comments regarding the need for flexibility in determining the appropriate metric to use to determine attainment of performance standards. Several commenters asserted that the rule should allow flexibility in the approach and the choice of metric should factor in whether one is assessing impingement mortality, entrainment or both; species and life stages affected, and compliance option.

EPA has decided to give the Director the authority to review and approve methods of determining compliance proposed by the facility as part of the Verification Monitoring Plan. (125.95(b)(7)), Technology Installation and Operation Plan (125.95(b)(4)(ii)), and, if applicable, the Restoration

Plan required at 125.95(b)(5). Thus, the facility will propose, and the Director will review and approve, species and life stages of concern. The Director may choose to require evaluation of all species or of certain indicator species; or the Director may elect to verify attainment of performance standards using biomass as a metric. EPA believes that as each situation will be somewhat unique, it should be left to the facility to propose and the Director approve the appropriate unit, biomass or actual counts.

c. Other Means of Determining Attainment of Performance Standards

Several commenters also suggested that EPA should allow for the use of existing data for measuring attainment in lieu of requiring existing facilities to collect and develop new data. Commenters also suggested that if a facility currently implements the best technology available to minimize adverse environmental impact, it should be found in compliance even if the newly promulgated performance standards are not being met. Other commenters expressed that a facility should be considered in compliance even during occurrences of unavoidable episodic impingement and entrainment events. These commenters stated that in such unusual circumstances, the facility should be provided with an exemption from any regulatory actions.

EPA agrees with commenters that under certain circumstances, facilities' historical data may be sufficient to verify that they are meeting performance standards, as long as the historical data is reflective of current operation of the facility and of current biological conditions at the site. For example,

under compliance alternative 2, a facility may use historical data to demonstrate that existing design and construction technologies, operational or restoration measures, meet the performance standards. EPA also believes that some historical data may be appropriate for determining the calculation baseline and for characterizing the nature of impingement and entrainment at the site, and therefore has given the Director the discretion to determine whether historical data are applicable to current conditions (see 125.95(b)(1)(ii), 125.95(b)(2)(i), and 125.95(b)(3)(iii)). In addition, a facility that proves, using existing data, that it has reduced its intake capacity commensurate with closed-cycle recirculating systems would be considered to be in compliance, and therefore would not be required to meet the performance standards for either impingement mortality or entrainment.

After the first permit term, facilities may submit a request for reduced information collection activities to their Director. Facilities that are able to demonstrate that conditions at their facility and in the waterbody from which their facility withdraws surface water are substantially unchanged since their previous permit application will qualify for reduced requirements (§ 125.95(a)(3)). In all these cases, historical data are used and required to measure success in meeting performance standards. However, facilities required to submit a Verification Monitoring Plan must still submit verification monitoring data for at least two years following implementation of technologies and/or operational measures.

Other commenters argued that a facility that is implementing permit conditions reflecting a historical determination of the best technology available should be considered in compliance with today's final rule even if the facility is not meeting performance standards. EPA disagrees that a historical determination of the best technology available is appropriate for complying with the requirements set forth by today's rule. Many historical determinations of the best technology available are less protective of aquatic organisms and ecosystems than the standards set by today's rule, and would undermine the national performance standards that EPA has determined reflect the current best technology available for minimizing adverse environmental impact. Furthermore, biological, chemical and physical conditions at the facilities may have changed since the earlier determinations were made, and the best technology available determinations may no longer apply. Many of the historical best technology available determinations are twenty years old or older and may not correspond with current waterbody or operating conditions.

The question whether a facility should be considered in compliance even during occurrences of unavoidable episodic impingement and entrainment events is left to the Director. At the Director's discretion, facilities that are generally in compliance, but that experience an unusual peak of impingement mortality and/or entrainment, may be considered to still be in compliance on the basis of past good performance. Moreover, the inclusion of a compliance determination alternative based on a

Technology Installation and Operations Plan in the final rule also addresses these episodic issues.

d. Monitoring

One commenter stated that monitoring frequencies should be established to address the inherent variability in the rates in impingement and entrainment over the seasons of the year. Monthly or biweekly monitoring is probably appropriate in many cases. The same commenter stated that standard statistical procedures could be followed to establish sample sizes needed to establish appropriate levels of precision in the estimates (*e.g.*, 95% confidence intervals within 15–25% of the mean). In contrast, another commenter pointed out that weekly sampling would be necessary to determine compliance, as had been necessary for the Salem facility. Another commenter suggested that the most cost-effective way of conducting studies would be over the periods of peak abundance.

Some commenters stated that facilities should be allowed to cease monitoring following achievement of the performance standards. Some **[*41620]** suggested that facilities meeting performance standards through a closed-cycle cooling system should be exempt from monitoring. Another commenter disagreed with the two-year monitoring requirement altogether.

EPA has determined that a uniform averaging period would not be appropriate; rather, the Director will be best suited to make all such determinations by evaluating these and other factors for each facility on a case-by-case basis. The Director will be able to make determinations regarding averaging periods

based upon site-specific factors, such as biological assemblage at the site, annual and diel fluctuations in concentration and populations present, and the selected compliance alternative. EPA disagrees that a facility should cease monitoring once performance standards are achieved, as site-specific conditions at any facility are bound to change with time, affecting a facility's ability to achieve performance standards. EPA agrees that facilities meeting performance standards through flow reductions commensurate with closed-cycle cooling should be exempt from monitoring (see § 125.94(a)(1)(i)). Finally, EPA believes that the two-year monitoring requirement is appropriate so that any site-specific variability in impingement and entrainment rates can be detected.

e. Timing

Some States favored flexibility in implementation including delaying the effective date for permits to be renewed soon after the rule is finalized. Some commenters suggested that the requirements of the rule must be timed so that facilities are not forced into a period of noncompliance because of the time needed to determine, design, and install new intake technology.

One commenter expressed that implementation schedules are too strict. Along the same vein, another commenter suggested that EPA should build flexibility into the implementation schedule so that facilities are not forced into periods of noncompliance.

Commenters generally wanted to see flexibility in the averaging periods (time increments for determining success in meeting the percent

reduction or production specified by the performance standards and restoration requirements in § 125.94,) and a way to tailor the sampling schedules to the needs of the site. These commenters indicated that the monitoring should be frequent enough to provide useful information, but not so intensive as to make the program unnecessarily costly or time-consuming. Furthermore, several recommended that a compliance schedule be written into the permits, to allow facilities to install and test new equipment. Several commenters agreed that different facilities might require different amounts of time, as dictated by where they are in the cycle and what their circumstances are.

EPA has provided for time to comply with permitting requirements. A facility whose permit expires more than four years after the date of publication of this final rule must submit the required information 180 days before the expiration of their permit. A facility whose permit expires within four years of the date of publication of this final rule may request that the Permit Director establish a schedule for submission of the permit application. Such submission should be as expeditiously as practicable, but no later than three and one-half years from the date of publication of this final rule. It is expected that the time that facilities need to comply with permitting requirements will be variable, ranging from one year for those not needing to do an impingement mortality and entrainment study to over three years for those needing to collect more than one years worth of impingement and entrainment data.

EPA has also provided that facilities may opt to comply with the Technology Installation and Operations Plan compliance scheme that allows facilities who properly implement the Technology Installation and Operations Plan (or Restoration Plan, as applicable) to be considered in compliance with the requirements of § 125.94. As indicated above, the final rule provides the Director the flexibility to establish an appropriate averaging period to meet the particular situation present in the waterbody within which the facility is located.

3. Entrainment Survival

EPA invited comment on whether to allow Phase II existing facilities to incorporate estimates of entrainment survival when determining compliance with the applicable performance standards. Commenters responded with numerous comments regarding survival with respect to the performance standards as well as comments regarding EPA's assumption of zero percent entrainment survival (100 percent mortality) in the benefits assessment for today's rule.

Some commenters opposing the zero percent survival assumption argued that in the event a facility can demonstrate entrainment survival, it should be awarded credits towards meeting performance standards. EPA disagrees. Today's final rule sets performance standards for reducing entrainment rather than reducing entrainment mortality. EPA chose this approach because EPA does not have sufficient data to establish performance standards based on entrainment survival for the technologies used as the basis for today's rule. If EPA had incorporated entrainment

survival into any of its conclusions regarding the appropriate performance standards, then the actual performance standard would most likely have been higher.

Many commenters argued that in many cases organisms survive entrainment and the zero percent survival assumption was too conservative. Some commenters suggested that EPA was biased in its approach to entrainment survival. For example, one commenter stated that EPA was biased as a result of relying heavily on old entrainment survival literature.

Based on its review of all entrainment survival studies available to the Agency, EPA believes that its assumption of zero percent survival in the benefits assessment is justified. The primary issue with regard to the studies EPA reviewed is whether the results can support a defensible estimate of survival substantially different from the value zero percent survival assumed by EPA. The review of the studies has shown that while organisms are alive in some of the discharge samples, the proportion of the organisms that are alive in the samples is highly variable and unpredictable on a national basis. In addition, some studies contain various sources of potential bias that may cause the estimated survival rates to be higher than the actual survival rates. For these reasons, EPA believes the current state of knowledge does not support reliable predictions of entrainment survival that would provide a defensible estimate for entrainment survival above zero at a national level. However, today's final rule does allow facilities to use the results of a well-constructed, sites-specific entrainment survival study, approved

by the Director, in their benefits assessments when seeking site-specific entrainment requirements. The permitting authority must review and accept the study before the results may be incorporated into the benefits assessments. In cases where there is uncertainty in the survival rates, permitting authorities may want to specify that benefits be presented as a range that reflects this uncertainty. **[*41621]**

4. Comprehensive Demonstration Study (CDS)

a. Requirements and Burden

The majority of commenters expressed two concerns regarding the CDS: (1) it was too burdensome and costly, and the volume of information required was too overwhelming, and (2) several components required clarification. These commenters generally suggested that the costs of such a study were underestimated, and many indicated that the cost estimates for completing the CDS contained misleading or incorrect information. Commenters indicated that the information required for completing the CDS was similar to the data that would be needed for implementing a purely site-specific approach and was therefore overly burdensome. Commenters suggested that EPA require a more simplified demonstration study or waive the requirement for facilities that select one of the approved technologies. Some commenters suggested, in general, that costs could be greatly reduced by streamlining this process, for example, by exempting facilities from certain components based on (1) facilities that have proven that they are not harming the aquatic community, and (2) facilities for which there exists relevant historical data.

Several States anticipated that the majority of their facilities were likely to choose the site-specific compliance alternative, and indicated that a rule that requires cost/benefit analyses for many decisions would be difficult to administer and require significant resources to implement. They claimed that the site-specific performance standards compliance option would impose a substantial review burden and would require specialized expertise. Some States questioned whether existing permitting staff resources over the first 5 years will be sufficient to review material and develop permit requirements.

Many commenters suggested that EPA could lower costs by streamlining the CDS, exempting facilities that are not causing adverse environmental impact or have historical data, and waiving the monitoring components for facilities that have installed approved technologies.

EPA believes that many efficiencies have been added to the rule since the proposal and the NODA to address concerns that the CDS is too burdensome and costly. First, EPA has provided five compliance alternatives to choose from, one of which allows a facility to install an approved design and construction technology with minimal CDS requirements. In addition, facilities with design intake flow commensurate with closed-cycle recirculating systems are exempt entirely from the CDS; facilities may only have to submit partial CDS information if they have reduced their design intake velocity to less than or equal to 0.5 feet per second and are only required to meet requirements as they relate to reductions in entrainment. In addition, requiring an early submission of the Proposal for

Information Collection allows the Director to potentially minimize the amount of information required by the facility. Also, by allowing the use of historical data, EPA has minimized costs for many facilities. In the cases where new studies are required, EPA has given the permittee and the Director discretion to set conditions for the studies which will not be overly burdensome. Facilities may also reduce costs incurred through the information collection process in subsequent permit terms by submitting, one year prior to expiration of the existing permit, a request for reduced permit application information based on conditions of their cooling water intake structure and waterbody remaining substantially unchanged since the previous permit issuance.

One commenter expressed concern that historical data should not be allowed in the development of the CDS, as it may not accurately reflect current conditions. EPA believes that some historical data may be appropriate for determining the calculation baseline and for characterizing the nature of impingement and entrainment at the site, and therefore has given the Director the discretion to determine whether historical data are applicable to current conditions. EPA expects to provide guidance to Directors to help them make determinations about historical data submitted by facilities. Historical data will not be used to determine attainment of performance standards; this will be verified through a monitoring program approved by the Director.

b. Timing of Submitting Information

Commenters submitted a variety of opinions about timing. Generally, most favored limiting the

submittal of CDS components to a frequency equal to or greater than once every five years (one permitting cycle) to reduce burden. Another commenter argued that there is no reason to mandate timing, and that approval of the Director should not be necessary. Other commenters suggested that a time frame is necessary, and that the information should be submitted with the renewal application for a NPDES permit. Numerous commenters asserted that consultation activities should occur prior to development of the Comprehensive Demonstration Study; that schedules and requirements should be specified in the permit for various data collection, analysis, and application submission activities; implementation schedules are too strict; and monitoring requirements need clarification. Yet another commenter suggested to "start the clock" with the issuance of the renewed permit. Commenters also indicated that anywhere from one year to several years might be necessary to verify success in meeting the performance standards. Several commenters suggested that given the nature of cooling water intake impacts and the proposed requirements, section 316(b) permit and BTA determinations should not be made every five years. Instead, they suggested that one-time determinations should suffice, or that facilities should be allowed to rely on previous section 316(b) demonstrations if conditions remain essentially unchanged. There was also some general confusion as to when the rule would actually become effective.

In response to the comment that EPA should not request submittal of CDS components more frequently than every five years or more, EPA has included a provision whereby a facility may be

granted reduced CDS submittal requirements if it can prove that conditions at the facility and in the waterbody have not substantially changed. Facilities will be required to review whether conditions, such as biological, chemical or physical conditions, have substantially changed at each permit renewal cycle. If conditions have changed, facilities will be required to submit all of the relevant CDS components (those that would be affected by the changed conditions when they submit the application for permit renewal.

One commenter stated that the CDS should be a one-time submittal. EPA disagrees that all components of the CDS should only be researched and submitted a single time for the lifetime of the facility, regardless of potential changes in the plant and/or waterbody, because the natural and anthropogenic changes that occur in waterbodies over time may affect a facility's ability to meet performance standards using the current design and construction technologies, operational measures, and/or restoration measures in place.

In response to comments that timing was not clear in previous versions of the rule, EPA agrees, and has clarified timing issues in today's final rule. A **[*41622]** facility whose permit expires more than four years after the date of publication of this final rule must submit the required information 180 days before the expiration of their permit. A facility whose permit expires within four years of the date of publication of this final rule may request that the Permit Director establish a schedule for submission of the permit application, but that such submission should be as expeditiously as practicable, but no

later than three and one-half years from the date of publication of this final rule. It is expected that the time that facilities need to comply with permitting requirements will be variable, ranging from one year for those not needing to do an impingement mortality and entrainment study to over three years for those needing to collect more than one years worth of impingement and entrainment data.

Some commenters felt that decisions about the timing of the CDS submittal should be left to the Director. EPA agrees and has provided only that the proposal for information collection should be submitted prior to the start of information collection activities, but that the facility may initiate information collection prior to receiving comment from the Permit Director. All other components of the Comprehensive Demonstration Study must be submitted 180 days prior to permit expiration except as noted above for the first, permit term following promulgation of the rule.

5. State Programs

Many States requested that existing State section 316(b) programs be allowed to be used to meet the requirements of Phase II. One commenter asserted that the Phase II rule should not overturn past State section 316(b) decisions at existing facilities that were made on a site-specific basis and that examined the impacts of the cooling water intake structure in relation to the specific biological community. Several commenters stated that EPA did not sufficiently recognize the work already done by the States in implementing section 316(b). Several commenters do not believe that a State should have to demonstrate that its program is "functionally equivalent" to

today's rule (*i.e.*, that its alternative regulatory requirements achieve environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under § 125.94).

In response to comments about existing State section 316(b) programs, EPA believes that § 125.90(c) in today's rule, by allowing alternative State programs, acknowledges the work already done by States. In response to the comment that a State should not have to prove that its program achieves environmental performance comparable to those that would be achieved under § 125.94, EPA disagrees. While EPA is giving significant flexibility to permitting agencies at the State level to determine how and what each facility must protect and monitor, it believes it is important to set uniform national performance standards.

F. Restoration

In the proposed rule EPA requested comments on the use of restoration measures by facilities within scope of the rulemaking (67 FR 17146). EPA received diverse comments. Many commenters supported a role for restoration measures. Several commenters stated that allowing restoration provides additional flexibility to those who must comply with the section 316(b) requirements, and may provide a more cost-effective means of minimizing adverse environmental impact than operational measures or design and construction technologies. Other commenters stated that restoration is a well-accepted concept that should have a voluntary role in section 316(b)

determinations and constitutes an appropriate means for reducing the potential for causing adverse environmental impact. Several commenters felt that restoration could provide significant benefits in addition to compensating for impingement and entrainment losses. A number of commenters requested flexibility in the implementation of restoration projects. Some commenters stated that restoration should not be limited to supplementing technology or operational measures, but should instead be allowed as a complete substitute for such measures. However, other commenters stated that restoration measures should only be used once every effort has been made to use technology to avoid impacts.

Commenters further stated that restoration should not be mandatory and that EPA lacks authority under section 316(b) to require it, but also asserted that it should have an important role in section 316(b) permitting decisions. Commenters also stated that restoration should not be considered the best technology available for minimizing adverse environmental impact because it is not a technology that addresses the location, design, construction, or capacity of a cooling water intake structure. However, one commenter argued that past restoration measures should be considered during a regulator's determination of whether or not adverse environmental impact is occurring from a cooling water intake structure.

Other commenters felt restoration should have a limited role or no role in the context of section 316(b). One commenter wrote that restoration measures, in the context of section 316(b), are generally

unworkable and that the only measurable restoration method would be offsetting, in which an applicant stops use of an older intake facility that does more harm than the proposed one. One commenter stated that restoration methods must reproduce the ecological value of lost organisms and that they have not seen restoration projects adequately successful in this manner in their region of the country. Many commenters pointed out uncertainties associated with compensating for those organisms impacted by a cooling water intake structure through restoration.

Some commenters suggested that, if restoration is allowed, there should be consultation with other State and Federal resource agencies to avoid inconsistent approaches and to provide useful information on the affected waterbody.

Several commenters remarked on EPA's proposal to include requirements for uncertainty analysis, adaptive management plans, and peer review in the final rule. Some commenters were in favor of the requirements and felt that they would enhance restoration measure certainty and performance. Some commenters were concerned that the requirements would be overly burdensome or would overly restrict the restoration measure options available to permit applicants.

EPA has retained restoration in the final rule and believes that the restoration requirements strike an appropriate balance between the need for flexibility and the need to ensure that restoration measures achieve ecological results that are comparable to other technologies on which the performance standards are based. Facilities that propose to use

restoration measures, in whole or in part, must demonstrate to the Director that they have evaluated the use of design and construction technologies and/or operational measures and found them to be less feasible, less cost-effective, or less environmentally desirable than meeting the applicable performance standards in whole or in part through the use of restoration measures. The requirement to look at design and construction technologies and/or **[*41623]** operational measures in order to ensure that facilities give due consideration to the technologies on which the performance standards are based.

Facilities must also demonstrate that the use of restoration measures achieves performance levels that are substantially similar to those that would be achieved under the applicable performance standards. To address concerns regarding the uncertainty of restoration measures, EPA has included, among other things, requirements for uncertainty analysis, adaptive management plans, monitoring, and peer review, if requested by the Director. Finally, EPA does not believe the requirements for restoration measures are overly burdensome or prescriptive as there is a need to ensure that these types of measures achieve the anticipated environmental benefit. Moreover, under the rule, facilities are provided at least three and one-half years to submit their restoration plan and complete the required studies.

G. Costs

1. Facility-Level Costs

Generally, commenters were split regarding the national costs of the rule. Industry commenters stated that the cost analysis presented in the proposal underestimated the compliance costs in several facets of the analysis, including capital costs of the technology, the site-specific contingencies associated with retrofitting, and facility down time. Several commenters stated that EPA underestimated the costs for the monitoring requirements for both the characterization study in the permit application and for verification monitoring. Other commenters generally stated the opposite, arguing that EPA overestimated the compliance costs, especially for installing cooling towers. Some commenters stated that costs should not be a consideration in section 316(b) determinations.

The Agency significantly revised the approach to developing costs for the NODA. Those revisions incorporated some of the comments on the costing methodology for technologies that reduce impingement and entrainment. EPA's approach to estimating the costs of the requirements of the final rule reflect the NODA comments on the revised methodology, and additional analyses. EPA, however, did not revise its estimates for cooling towers subsequent to the NODA because it decided not to further pursue this regulatory option for the reasons outlined more specifically in Section VII. EPA believes that our costing of cooling tower technology is appropriate as it is based on vendor

and engineering firm experience in developing costs for Phase II facilities.

2. Market-Level Impacts

Numerous industry commenters stated that EPA significantly underestimated the impacts to generators, consumers, reliability, and energy supply. EPA disagrees with these commenters. EPA performed an analysis of facility- and market-level impacts (including impacts to generators, consumers, reliability, and energy supply) using the Integrated Planning Model (IPM®), which has been widely used in air quality regulations and in other public policy arenas affecting the electric power generation industry.

One commenter stated that the IPM analysis does not account for the economic impacts of other regulatory programs. EPA disagrees with this assertion. The IPM base case accounts for costs associated with current federal and state air quality requirements, including future implementation of SO_2 and NO_X requirements of Title IV of the Clean Air Act and the NO_X SIP call as implemented through a cap and trade program. Because of its relative newness, it does not account for costs associated with the Phase I facility regulations.

One commenter stated that EPA justified the rule by using a cost-to-revenue comparison and that this comparison neither measures profitability nor represents the most efficient economic solution for each facility. As discussed in Section VII. above, the economic practicability of the Phase II regulation is based on the electricity market model analyses using the IPM, not the cost-to-revenue ratio. The cost-to-

revenue ratio is only one of several additional measures EPA used to assess the magnitude of compliance costs.

Some commenters stated that EPA did not properly take account of differences between utilities, which own and operate rate-based facilities, and nonutilities, which own and operate competitive generating facilities. EPA disagrees with this comment. EPA believes that in a deregulated market, the distinction between utilities and nonutilities is no longer relevant. While such a distinction may have been important in the past, when only a few unregulated nonutilities competed with regulated utilities, this is no longer the case. The share of Phase II facilities that are owned by unregulated entities has increased from 2 percent in 1997 to 31 percent in 2001. By the time the final rule will take effect, even more Phase II facilities that currently operate under a rate-based system will be operating in a competitive market. Furthermore, EPA does not believe that nonutilities will be differentially impacted compared to utilities, even in the case that deregulation might not have taken effect in all markets by the time this rule is implemented. Competitive pressures, even in regulated environments, will reduce the ability of utilities to pass on costs to their consumers.

Some commenters stated that small or publicly owned facilities may be significantly affected. EPA disagrees with this statement. EPA's SBREFA analysis showed that this rule will not lead to a significant economic impact on a substantial number of small entities (See Section XIII.C below). While municipally owned facilities bear a relatively larger

compliance cost per MW of generating capacity than do facilities owned by other types of entities, EPA's analyses show that these costs are not expected to lead to significant economic impacts for these facilities.

Some commenters stated that even a requirement to convert all facilities to closed-cycle cooling would not significantly affect energy supply and that the costs to facilities and consumers is small and in some cases, overstated by EPA's analysis. EPA disagrees with this statement. EPA considered several options that would require some or all facilities to install closed-cycle recirculating systems and rejected them on the basis of economic practicability and technological feasibility. See Section VII.B for more detail on why EPA rejected closed-cycle recirculating systems.

H. Benefits

In its analysis for section 316(b) Phase II Proposal, EPA relied on nine case studies to estimate the potential economic benefits of reduced impingement and entrainment. EPA extrapolated facility-specific estimates to other facilities located on the same waterbody type and summed the results for all waterbody types to obtain national estimates. During the comment period on the proposed rule EPA received numerous comments on the valuation approaches applied to evaluate the proposed rule, including commercial and recreational fishing benefits, non-use benefits, benefits to threatened and endangered species (T&E), as well as on the methods used to extrapolate case study results to the national level. EPA tried to address concerns raised by commenters on the proposal in the revised

methodology presented in the NODA and the final rule analysis. **[*41624]**

1. Benefits Analysis Design

A number of commenters expressed concern about EPA's reliance on a few case studies and the extrapolation method used for estimating benefits at the national level for the proposed rule analysis. The commenters noted that even within the same waterbody type, there are important ecological and socioeconomic differences among different regions of the country. To address this concern, EPA revised the design of its analysis to examine cooling water intake structure impacts at the regional-scale. The estimated benefits were then aggregated across all regions to yield the national benefits estimate. These analytical design changes were presented in the NODA. No major comments were received on EPA's regional benefit approach as described in the NODA.

2. Commercial Fishing Benefits

During the comment period on the proposed rule EPA received a number of comments on the methods used to estimate producer surplus and consumer surplus in the commercial fishing sector. Commenters felt that the methods overestimated benefits. The new methods used by EPA assume that producer surplus is 0% to 40% of gross revenues in the commercial fishing sector. EPA also now assumes that the Phase II rule will not create increases in commercial harvest large enough to impact prices. Thus, no consumer surplus impact is estimated. Commenters on the NODA noted these changes and agreed with them.

3. Recreational Fishing Benefits

A number of comments were received on the recreational fishing benefits estimates EPA included in the proposal, which primarily relied on a benefits transfer approach. Benefit transfer involves adapting research conducted for another purpose in the available literature to address the policy questions in hand. For more detail on the valuation methods used in the final rule analysis, see Chapter A9 of the Regional Analysis document (DCN 6-0003). For three of the nine case studies, this analysis was supplemented by original revealed preference studies. Revealed preference methods use observed behavior to infer users' value for environmental goods and services. Examples of revealed preference methods include travel cost, hedonic pricing, and random utility models (RUM). For more detail on the revealed preference methods used in the final rule analysis, see Chapters A9 and A11 of the Regional Analysis document (DCN 6-0003). Although most commenters agreed that properly executed benefits transfer is an appropriate method for valuing nonmarket goods, they pointed out that original revealed preference studies that provide site-specific recreational fishing benefit estimates provide a superior alternative to benefits transfer. In response to these comments, EPA developed original or used available region-specific recreational angler behavior models, which provide site-specific estimates of willingness-to-pay for improvements in recreational fishing opportunities, to estimate recreational fishing benefits from reduced impingement and entrainment for seven of the eight study regions. Chapter A11 of the Regional Analysis document provides detailed discussion of the

methodology used in EPA's RUM analysis (DCN 6-0003). Due to data limitations, EPA used a benefit transfer approach to value recreation fishing benefits from reduced impingement and entrainment in the Inland region.

4. Non-Use Benefits

Numerous comments were received on EPA's proposed non-use benefit estimates. Most commenters agreed that non-use values are difficult to estimate and that EPA's estimates of non-use benefits using the 50% rule was inappropriate because it relies on outdated studies. Commenters, however, disagreed as to whether EPA had vastly overstated or underestimated non-use benefits in the proposed Phase II rule analysis.

Some commenters stated that EPA's approach to estimating non-use benefits of the proposed rule significantly overestimates total benefits and that ecological benefits of the section 316(b) regulation are negligible. Other commenters asserted that EPA's benefits estimates significantly undervalued the total ecological benefits (including use and non-use) of preventing fish kills. These commenters indicated that it would be impossible to claim that the value of the unharvested commercial and recreational and forage species lost to impingement and entrainment was equal to zero. Reasons some commenters gave for the underestimation of total benefits included the following: total losses were underestimated by using outdated monitoring data for periods when population levels (and therefore impingement and entrainment) were much lower than the present; cumulative impacts were not sufficiently considered; recreational and commercial

values were underestimated; commercial invertebrate species were ignored; ecological value of forage species was not considered; non-use benefits were underestimated; and secondary economic impacts were not included. Overall these commenters argued that a net benefit underestimation could be corrected by (1) assuming that non-use values were two times the estimated value of recreation, commercial and forage values; and (2) assuming that unharvested fish had a value greater than zero.

In response to public comments regarding the analysis of non-use values in the proposed rule, EPA considered the results of several different approaches to quantifying non-use values. The Agency points out that none of the available methods for estimating either use or non-use values of ecological resources is perfectly accurate; all have shortcomings.

EPA has determined that none of the methods it considered for assessing non-use benefits provided results that were appropriate to include in this final rule, and has thus decided to rely on a qualitative discussion of non-use benefits. The uncertainties and methodological issues raised in the approaches considered could not be resolved in time for inclusion in the rule. EPA continues to evaluate various approaches for evaluating non-use benefits of CWA rules.

5. Habitat Replacement Cost (HRC)

Some commenters argued that the HRC methods are not legitimate valuation methods because they concern costs, not benefits. However, other commenters argued that although HRC analysis is

not a benefit's analysis in the strict economic sense it can provide a practical approach to capturing the full range of ecosystem services and, thus, is appropriate for evaluating the benefits of this rule. These commenters further pointed out that "restoration cost is used as a measure of damages under CERCLA for Superfund sites, under the National Marine Sanctuaries Act, and under the oil spill provisions of the Clean Water Act. Use of restoration costs was explicitly upheld in the landmark Ohio vs. Interior court decision of 1989."

EPA has removed the disputed results of the HRC analyses from its benefits estimates for the final rule. For the NODA, EPA revised the HRC analysis presented in the proposed rule (see 67 FR 17191). Instead of the costs of habitat replacement, EPA used estimated willingness-to-pay values for the resource improvements that would be achieved by the habitat replacement/restoration equivalents. **[*41625]**

During the comment period on the NODA, EPA received a number of comments on the revised habitat-based valuation method. Specifically, several commenters questioned the appropriateness of using willingness to pay values for habitat restoration as a "proxy" for either the total value or the non-use value of the fishery resources that would be preserved due to reduced impingement and entrainment. EPA explored this approach to estimating non-use values for three case study regions: the North Atlantic, Mid-Atlantic, and Great Lakes Regions. However, due to limitations and uncertainties regarding the application of this methodology, EPA elected not to include benefits

based on this approach in the costs and benefits analysis of the final section 316(b) rule.

6. Benefits to Threatened and Endangered Species.

Similarly to the HRC approach, commenters strongly disagreed about the appropriateness of EPA using the societal revealed preference (SRP) method to value benefits from reducing impingement and entrainment of threatened and endangered species because these methods concern costs not benefits. The SRP method uses (1) evidence of actions taken to benefit a resource that were developed, approved, and implemented voluntarily by government and quasi-government agencies and (2) data on anticipated and actual expenditures required to complete the actions. EPA has removed the disputed results of the societal revealed preference analyses from its benefits estimates for the final rule because the uncertainties and methodological issues raised in the approaches considered could not be resolved in time for inclusion in the rule.

Some commenters argued that benefits transfer is the second best approach to estimating benefits from improved protection of threatened and endangered species if conducting an original stated preference study is not feasible. Specifically, the commenters recommended that EPA use benefits transfer for valuing improved protection of threatened and endangered species instead of the societal revealed preference method. In response to these comments, EPA has explored a benefits transfer approach to valuing improved protection of threatened and endangered species due to the final section 316(b) regulation. For detail, see Chapters A13 and B6 of the Regional Analysis document (DCN 6- 0003).

EPA, however, notes that benefits based on this method were not included in the benefit cost analysis of the final section 316(b) rule due to the uncertainties and limitations discussed in Section A13-6.1 of the Regional Study document (see DCN 6-0003).

7. Timing of Benefits

During the comment period on the proposed rule, EPA received a number of comments on the time at which benefits of the rule accrue to society. The commenters assert that the estimated commercial and recreational fishing benefits are overstated because timing of benefits was not taken into account. Specifically, the commenters argue that benefits could not be fully realized until installation of the cooling technology is completed and enough years pass after that first year of reduced impingement and entrainment mortality such that every fish avoiding impingement and entrainment in that year can be harvested by commercial and recreational fishermen. In response to public comments on the proposed rule analysis, EPA revised recreational and commercial fishing benefits analysis to account for a one-year construction period required to install CWIS technology to reduce impingement and entrainment, and a time lag between impingement and entrainment cessation and the time when recreational and commercial fish species will be large enough to be harvested. In accounting for a delay in benefits, EPA used both a three percent and a seven percent discount rate as recommended by OMB requirements.

I. EPA Legal Authority

1. Authority To Set a National Standard for Cooling Water Intake Structures

Some commenters challenged EPA's authority to set a national standard for cooling water intake structures, arguing that CWA section 316(b) requires EPA to provide a site-specific assessment of "best technology available to minimize adverse environmental impact." These commenters maintain that the language and legislative history of CWA section 316(b), the objectives of the CWA, and prior EPA practice of site-specific application of CWA section 316(b) preclude EPA from setting a national standard under this rule.

EPA is authorized under section 501(a) of the Clean Water Act "to prescribe such regulations as are necessary to carry out [its] functions" under the Clean Water Act. Moreover, EPA interprets CWA section 316(b) to authorize national requirements for cooling water intake structures. CWA section 316(b) applies to sources subject to CWA and , which authorize EPA to promulgate national categorical effluent limitations guidelines and standards for direct dischargers of pollutants. The reference in CWA section 316(b) to these sections indicates that Congress expected that CWA section 316(b) requirements, like those of CWA sections 301 and 306, could be applied as a national, categorical standard. *Cronin* v. *Browner*, 898 F. Supp. 1052, 1060 (1995) ("EPA was also free to choose, as it did, to implement section 316(b) by issuing one overarching regulation that would apply to all categories of point source subject to and that utilize

cooling water intake structures."); *see also Virginia Electric Power Co.* v. *Costle*, 566 F.2d 446 (1977).

2. Authority To Consider Cost in Establishing Performance Standards and Compliance Options

Some commenters objected to EPA's consideration of costs in the determination of BTA. These commenters note that CWA section 316(b) does not expressly mention compliance costs, in contrast to other technology-based provisions of the CWA, which explicitly direct EPA to consider such costs. If Congress had intended that EPA consider costs under section 316(b), they argue, it would have expressly directed the EPA to do so.

EPA believes that it legitimately considered costs in establishing "best technology available" under CWA section 316(b). Although CWA section 316(b) does not define the term "available," it expressly refers to CWA sections 301 and 306—both of which require EPA to consider costs in determining the "availability" of a technology. Specifically, CWA section 301(b)(1)(A) requires certain existing facilities to meet effluent limitations based on "best practicable control technology currently available," which requires "consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." 33 U.S.C. 1314(b)(1)(B). Similarly, CWA section 301(b)(2)(A) requires application of the "best available technology economically achievable," which in turn requires consideration of "the cost of achieving such effluent reduction." 33 U.S.C. 1314(b)(2)(B). Finally, CWA section 301(b)(1)(B), which governs the effluent discharge standards for new sources, expressly states that in establishing the

"best available demonstrated control technology" the Administrator shall take into consideration "the cost of achieving such effluent reduction" 33 U.S.C. 1316(b)(1)(B). Although these standards **[*41626]** are somewhat different, each mandates the consideration of costs in establishing the technology-based standard. Because CWA sections 301 and 306 are expressly cross-referenced in CWA section 316(b), EPA believes that it reasonably interpreted CWA section 316(b) as authorizing consideration of the same factors considered under CWA 301 and 306, including cost. EPA's interpretation of section 316(b) as authorizing a consideration of costs was explicitly upheld in litigation on the Phase I new facilities rule. *Riverkeeper* v. *EPA*, slip op. at 28 (2nd Cir., Feb. 3, 2004).

EPA's interpretation is supported by the legislative history of CWA section 316(b): "'best technology available' should be interpreted as best technology available at an economically practicable cost." *See* 118 Cong. Rec. 33,762 (1972), reprinted in 1 Legislative History of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Sess. at 264 (Comm. Print 1973) (Statement of Representative Don H. Clausen). EPA's interpretation of CWA section 316(b) is also consistent with judicial interpretations of the section. See, *e.g.*, *Seacoast Anti-Pollution League* v. *Costle*, 597 F. 2d 306, 311 (1st Cir. 1979) ("The legislative history clearly makes cost an acceptable consideration in determining whether the intake design 'reflect[s] the best technology available'"); *Hudson Riverkeeper Fund, Inc.* v. *Orange & Rockland Util., Inc.*, 835 F. Supp. 160, 165–66 (S.D.N.Y. 1993).

3. Authority To Allow Site-Specific Determination of BTA To Minimize AEI Based on a Cost-Cost Comparison

The final rule allows a facility to pursue a site-specific determination of "best technology available to minimize adverse environmental impact" where the facility can demonstrate that its costs of compliance under the compliance alternatives in § 125.94(a)(2) through (4) would be significantly greater than the costs considered by the Administrator for a like facility in establishing the performance standard.

Some commenters argue that CWA section 316(b) does not authorize EPA to provide for a site-specific assessment of "best technology available." These commenters argued that EPA was required under CWA section 316(b) to set a national standard for "best technology available" (BTA), at least as stringent as the national standard for "best available technology" (BAT) under CWA . These commenters asserted that the similar wording of the BTA and BAT requirements, and the fact that CWA section 316(b) explicitly references CWA as the basis for its application, indicates legislative intent to equate BTA with BAT and thus requires a national—not site-specific—standard.

EPA disagrees. The CWA section 316(b) authorizes a site-specific determination of BTA. Although, the CWA section 316(b) authorizes EPA to promulgate national categorical requirements, EPA also notes that the variety of factors to be considered in determining these requirements—such as location and design—indicate that site-specific conditions can be highly relevant to the determination of BTA to

minimize adverse environmental impact. In addition to specifying "best technology available" in relation to a national categorical performance standard, today's rule also authorizes a site-specific determination of BTA when conditions at the site lead to a more costly array of controls than EPA had expected would be necessary to achieve the applicable performance standards.

This site-specific compliance option is similar to the "fundamentally different factors" provision in CWA , which authorizes alternative requirements for sources subject to national technology-based standards for effluent discharges, if the facility can establish that it is fundamentally different with respect to factors considered by EPA in promulgating the national standard. The fundamentally different factors provision was added to the CWA in 1987, but prior to the amendment, both the Second Circuit and the Supreme Court upheld EPA's rules containing provisions for alternative requirements as reasonable interpretations of the statute. *NRDC* v. *EPA*, 537 F.2d 642, 647 (2d Cir. 1976) ("the establishment of the variance clause is a valid exercise of the EPA's rulemaking authority pursuant to which authorizes the Administrator to promulgate regulations which are necessary and proper to implement the Act"); *EPA* v. *National Crushed Stone Ass'n*, 449 U.S. 64 (1980) (approving EPA's alternative requirements provision in a standard adopted pursuant to CWA section 301(b)(1), even though the statute did not expressly permit a variance.) EPA's alternative site-specific compliance option in this rule is similarly a reasonable interpretation of section 316(b) and a valid exercise of its rulemaking authority under CWA section 501.

Based on this interpretation, EPA and State permitting authorities have been implementing CWA section 316(b) on a case by case basis for over 25 years. Such a case-by-case determination of BTA has been recognized by courts as being consistent with the statute. *See Hudson Riverkeeper Fund* v. *Orange and Rockland Util*, 835 F. Supp. 160, 165 (S.D.N.Y. 1993) ("This leaves to the permit writer an opportunity to impose conditions on a case by case basis, consistent with the statute").

Some commenters specifically challenged EPA's authority to consider costs in its site-specific assessment of best technology available. However, as discussed earlier, EPA reasonably interprets CWA section 316(b) to authorize it to consider costs of compliance in determining best technology "available." Therefore, where EPA fails to consider a facility's unusual or disproportionate costs in setting the national requirements for "best technology available," it reasonably authorizes permit authorities to set site-specific alternative limits to account for these costs. See *Riverkeeper* v. *EPA*, slip op. at 25 (2nd Cir. Feb. 3, 2004) (upholding site-specific alternative limits under the Phase I rule for new facilities where a particular facility faces disproportionate compliance costs.)

In addition, EPA notes that—contrary to some commenters' assertions—the rule does not in fact authorize permitting authorities to consider a facility's "ability to pay" in its site-specific assessment of BTA. It only allows consideration of whether the facility has unusual or disproportionate compliance costs relative to those considered in establishing the performance standards—not

whether the facility has the financial resources to pay for the required technology. Moreover, in setting the alternative BTA requirements, the permit authorities may depart from the rule's national technology-based standards only insofar as necessary to account for the unusual circumstances not considered by the Agency during its rulemaking.

4. Authority To Allow Site-Specific Assessment of BTA Where Facility's Costs of Compliance Are Significantly Greater Than Benefits of Compliance

Some commenters objected to the second site specific regulatory option—authorizing a site-specific determination of best technology available where the facility can demonstrate that its costs of compliance under § 125.94(a)(2) through (3) would be significantly greater than the benefits of complying with the applicable performance requirements at the facility. These commenters argue that a cost-benefit decision making criterion is not authorized under the CWA. Many of these commenters assert **[*41627]** that while it may be reasonable for EPA to exclude technologies if their costs are "wholly disproportionate" to the benefits to be achieved, EPA lacks the statutory authority to conduct a formal cost/benefit analysis to determine the best technology available on a site-specific basis.

EPA believes that the Clean Water Act authorizes a site-specific determination of the best technology available to *minimize* adverse environmental impact where the costs of compliance with the rule's performance standards are significantly greater than its benefits. This authority stems from the statutory language of CWA section 316(b). As discussed in Section III above, Section 316(b) requires that

cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. The object of the "best technology available" is explicitly articulated by reference to the receiving water: to minimize adverse environmental impact in the waters from which cooling water is withdrawn. In contrast, under the goal of BAT is explicitly articulated by reference to a different purpose, to make reasonable further progress toward the national goal of eliminating the discharge of all pollutants (section 301(b)(2)(A)). Similarly, under section 304, the goal of BPT and BCT is explicitly articulated by reference to the degree of effluent reduction attainable. (section 304(b)(1)(A) and section 304(b)(4)(A)). EPA has previously considered the costs of technologies in relation to the benefits of minimizing adverse environmental impact in establishing 316(b) limits, which historically have been done on a case-by-case basis. See, *e.g.*, *In Re Public Service Co. of New Hampshire*, 10 ERC 1257 (June 17, 1977); *In Re Public Service Co. of New Hampshire*, 1 EAD 455 (Aug. 4, 1978); *Seacoast Anti-Pollution League* v. *Costle*, 597 F.2d 306 (1st Cir. 1979). Under CWA section 316(b), EPA may consider the benefits that the technology-based standard would produce in a particular waterbody, to ensure that it will "minimize adverse environmental impact." EPA believes that the technology-based standards established in this final rule will, as a national matter, "minimize adverse environmental impact." However, the degree of minimization contemplated by the national performance standards may not be justified by site-specific conditions. In other words, depending on the circumstances of the receiving

water, it may be that application of less stringent controls than those that would otherwise be required by the performance standards will achieve the statutory requirement to "minimize" adverse environmental impact, when considered in light of economic practicability. An extreme example is a highly degraded ship channel with few fish and shellfish, but such situations can only be identified and addressed through a site-specific assessment.

For these reasons, EPA reasonably interprets the phrase "minimize adverse environmental impact" in section 316(b) to authorize a site-specific consideration of the benefits of the technology-based standard on the receiving water. EPA continues to believe that any impingement or entrainment would be an adverse environmental impact, but has determined that 316(b) does not require minimization of adverse environmental impact beyond that which can be achieved at a cost that is economically practicable. EPA believes that the relationship between costs and benefits is one component of economic practicability for purposes of section 316(b), and as noted previously, the legislative history indicates that economic practicability may be considered in determining what is best technology *available* for purposes of 316(b). EPA believes that allowing a relaxation of the performance standards when costs significantly exceed benefits, but only to the extent justified by the significantly greater costs, is a reasonable way of ensuring that adverse environmental impact be minimized at an economically practicable cost. This does not mean that there is a need to make a finding of "adverse environmental impact" before performance standard based CWA section 316(b)

requirements would apply. Rather, EPA is authorizing an exception to performance standard based requirements on a site-specific basis in limited circumstances: when the costs of complying with the national performance standards are significantly greater than the benefits of compliance at a particular site.

5. Authority To Allow Restoration To Comply With the Rule Requirements

The final rule authorizes the use of restoration measures that produce and result in increases of fish and shellfish in a facility's watershed in place of, or as a supplement to, installing design and control technologies and/or operational measures that reduce impingement mortality and entrainment. Restoration measures can include a wide range of activities including measures to enhance fish habitat and reduce stresses on aquatic life; creation of new habitats to serve as spawning or nursery areas, and creation of a fish hatchery and/or restocking of fish being impinged and entrained with fish that perform a substantially similar function in the aquatic community.

While the Phase I rule also authorized use of restoration measures, today's rule includes additional regulatory controls on the use of restoration measures to ensure that they are used appropriately to comply with the applicable performance requirements or site specific alternative requirements. For example, restoration measures are authorized only after a facility demonstrates to the permitting authority that it has evaluated other design and construction technologies and operational measures and determined that they are less feasible,

less cost-effective, or less environmentally desirable than meeting the performance standards or alternative site-specific requirements in whole or in part through the use of restoration measures. The facility must also demonstrate that the proposed restoration measures will produce ecological benefits (*i.e.*, the production of fish and shellfish for the facility's waterbody or watershed, including maintenance of community structure and function) at a level that is substantially similar to the level a facility would achieve through compliance with the applicable performance standards or alternative site-specific requirements. Further, the permitting authority must review and approve the restoration plan to determine whether the proposed restoration measures will meet the applicable performance standards or site specific alternative requirements. Consequently, the restoration provisions of today's rule are designed to minimize adverse environmental impact to a degree that is comparable to the other technologies on which the rule is based.

The use of restoration to meet the requirements of section 316(b) is consistent with the goals of the Clean Water Act: measures that restore fish and shellfish to compensate for those that are impinged and entrained further the objective of the Clean Water Act "to restore, maintain, and protect the biological integrity of the nation's waters." 33 U.S.C. 1251(a) (emphasis added). It is also consistent with EPA's and States' past practices in implementing section 316(b) in individual permit decisions. For at least twenty years, EPA and States have authorized existing facilities to comply with section 316(b) requirements, at least in part, through the use of restoration measures. For example, the Chalk Point

Generating Station, located on the Patuxent River in Prince George's **[*41628]** County, Maryland constructed a fish rearing facility in partial compliance of its 316(b) obligations (DCN-1-5023-PR).

Although the United States Court of Appeals for the Second Circuit recently remanded the portion of EPA's Phase I new facility rule that authorized restoration measures to meet that rule's requirements, EPA believes that portion of the decision should not apply to this Phase II rulemaking. Indeed, the Second Circuit explicitly stated that "[i]n no way [does it] mean to predetermine the factors and standard applicable to Phase II and III of the rulemaking." *Riverkeeper* v. *EPA*, slip op. at 12, note 13 (2nd Cir. Feb. 3, 2004). This is probably because there are important differences between new and existing facilities that warrant interpreting section 316(b) more broadly to give existing facilities additional flexibility to comply with section 316(b). As noted above, restoration measures have been used to comply with section 316(b) limits at existing facilities for several years because of the more limited availability of other technologies for existing facilities. Costs to retrofit an existing facility to install a "hard" technology can be much higher than costs to install one at the time a facility is constructed, and those costs can vary considerably from site to site. Thus, the range of technologies that are "available" to existing facilities to meet the performance standards is narrower than the range of technologies available to new facilities.

In recognition of the vast differences between existing and new facilities, Congress established

separate sections in the Clean Water Act for establishing discharge limitations on existing and new facilities. Effluent limitations guidelines for existing facilities are established under sections 301 and 304, whereas new source performance standards are established under section 306. Those sections set out two distinct sets of factors for developing effluent limitations guidelines for existing facilities and new source performance standards for new facilities. Notably, there are only two factors explicitly stated in section 306 for the Administrator to consider in establishing new source performance standards—cost and non-water quality impacts, whereas for existing facilities Congress calls upon EPA to consider a much broader range of factors in :

> the age of equipment and facilities involved, the process employed, the engineering aspects . . . of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impacts (including energy requirements), and such other factors as [EPA] deems appropriate.

This list reflects the wide range of facility characteristics and circumstances that can influence the feasibility and availability of a particular technology across a particular industry. Existing facilities generally face more and different problems than new facilities because of the technological challenges and high costs associated with retrofitting as compared to building a new facility. Indeed, by including the phrase "and such other factors as [EPA] deems appropriate," Congress made certain that EPA would have sufficient flexibility in

establishing limitations for existing facilities to consider all relevant factors.

For several other reasons, EPA believes the Second Circuit decision is not binding on this Phase II rule. First, section 316(b) requires the design of a cooling water intake structure to reflect the best technology available to "minimize adverse environmental impact." The phrase "minimize adverse environmental impact " is not defined in section 316(b). For the Phase II rule, EPA interprets this phrase to allow facilities to minimize adverse environmental impact by reducing impingement and entrainment, or to minimize adverse environmental impact by compensating for those impacts after the fact. Section 316(b) does not explicitly state when the adverse environmental impact of cooling water structures must be minimized—that is whether they must be prevented from occurring in the first place or compensated for after the fact or where the minimization most occurs—at the point of intake or at some other location in the same watershed. Therefore, under *Chevron*, EPA is authorized to define "minimize" to authorize restoration at existing facilities to minimize the effects of adverse environmental impact.

In another context under the Clean Water Act, EPA has interpreted authority to "minimize adverse effects" as including authority to require environmental restoration. Section 404 of the CWA authorizes the Army Corps of Engineers to issue permits for discharges of dredged or fill material into waters of the United States. EPA was granted authority to establish regulations containing environmental guidelines to be met by the Corps in

issuing section 404 permits. See CWA section 404(b)(1). Current regulations, in place since 1980, prohibit a discharge unless, among other requirements, all practicable steps are taken to avoid, minimize and mitigate for the environmental effects of a discharge. See 40 CFR 230.10. Of particular relevance here, the regulations require that steps be taken to "minimize potential adverse effects of the discharge on the aquatic ecosystem" 40 CFR 230.19(d). EPA has specifically defined minimization steps to include environmental restoration. See 40 CFR 230.75(d) ("Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat").

Moreover, at the time of the Phase I litigation, EPA had not interpreted the term "reflect" in section 316(b), and therefore, the Second Circuit did not consider its meaning in determining whether restoration could be used as a design technology to meet the Phase I rule requirements. Section 316(b) requires that "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." (emphasis supplied). The term "reflect" is significant in two respects. First, it indicates that the design, location, construction and capacity of the cooling water intake structure itself must be based on the best technology available for such structures. This authorizes EPA to identify technologies that can be incorporated into the physical structure of the intake equipment. It also indicates that the choice of what actually is the best physical configuration of a particular cooling water intake structure can take into account, *i.e.*, reflect,

other technologies—and their effects—that are not incorporated into the structure itself. For example, barrier nets are not incorporated into the physical design of the cooling water intake structure, but their use—and effectiveness—influences the physical design of the cooling water intake structure. Another relevant example is the technology known as "closed-cycle" cooling. Although this technology is physically independent of the cooling water intake structure, it directly influences decisions regarding the design capacity of the cooling water intake structure: as more cooling water is recycled, less needs to be withdrawn. Both barrier nets and closed-cycle cooling are considered "design" technologies. Similarly, properly designed restoration measures can be best technologies available that can influence the design of the physical cooling water intake structure. To put it another way, for purposes of minimizing adverse environmental impact, requirements for cooling water intake structures reflect a variety of best technologies available, which EPA **[*41629]** construes to include restoration measures. A dry cooling system is another example of a technology that although physically independent of the cooling water intake structure is nonetheless considered an acceptable method to minimize adverse environmental impacts. In fact, since a dry cooling system uses air as a cooling medium, it uses little or no water, dispensing altogether with the need for a cooling water intake structure.

EPA has discretion to characterize restoration measures as technologies for purposes of section 316(b). Section 316(b) does not define either the phrase "cooling water intake structure" or the term

"technology" and, therefore, leaves their interpretation to EPA. EPA has defined the phrase cooling water intake structure in today's rule to mean the total physical structure and any associated waterways used to withdraw cooling water from waters of the United States. This definition embraces elements both internal and external to the intake equipment. EPA did not define the term technology in today's rule, but looked for guidance to , which the Second Circuit has recognized can help illuminate section 316(b). best available technology limitations are based on factors set forth in . , while not using the term technology, discusses the "application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives." This is a broad, non-exclusive list. Indeed, BAT effluent limitations guidelines under this authority have been based on a vast array of treatment techniques, operation practices (including chemical substitution), and management practices. See 40 CFR Part 420 (effluent guidelines for concentrated animal feeding operations); 40 CFR Part 430, Subparts B & E (effluent guideline for pulp and paper industry); See also 62 FR 18504 (April 15, 1998).

Employing this broad concept of technology, in today's rule EPA has determined that the design of cooling water intake structures may reflect technologies relating to the restoration of fish and shellfish in the waters from which cooling water is withdrawn. Restoration is not included in the definition of "design and construction technology" in today's rule so as to distinguish restoration from "hard" technologies for purposes of the rule. Under

the regulatory scheme of the final rule, restoration is treated differently than other technologies for several purposes, all of which are to help ensure that restoration projects achieve substantially similar performance as design and construction technologies and/or operational measures. When these restoration technologies are used they must produce ecological benefits (the production of fish and shellfish for a facility's waterbody or watershed, including maintenance of community structure and function) at a level that is substantially similar to the level the facility would achieve by using other design and construction technologies and/or operational measures to achieve the applicable performance standards or alternative site-specific performance requirements in § 125.94. In other words, the operation of the cooling water intake structure together with these restoration technologies will achieve the overall performance objective of the statute: to minimize the adverse environmental impact of withdrawing cooling water. For facilities using this authority, their hardware decisions for the cooling water intake structure thus take into account—or reflect—the impacts of restoration technology.

EPA acknowledges that in 1982, when Congress was considering substantial amendments to the Clean Water Act, EPA testified in support of a proposed amendment to CWA section 316(b) that would have expressly authorized the use of restoration measures as a compliance option, suggesting that EPA may have interpreted section 316(b) at that time as not authorizing restoration measures to minimize the adverse environmental impact of cooling water intake structures. In EPA's

view, the Second Circuit gave undue weight to that testimony, particularly because it was provided before the Supreme Court's decision in *Chevron U.S.A.* v. *Natural Resources Defense Council*, 467 U.S. 837 (1984), which gave administrative agencies latitude to fill in the gaps created by ambiguities in statutes the agencies have been charged by Congress to implement. For at least twenty years, EPA and States have authorized existing facilities to comply with section 316(b) requirements, at least in part, through the use of restoration measures. Additionally, since 1982 EPA has gathered substantially more data to inform its judgment regarding cooling water intake structures, the environmental impact resulting from them, and various technologies available to reduce impingement and entrainment. Finally, EPA notes that, in contrast to water quality based effluent limitations that are included in NPDES permits to meet water quality standards, the required performance of restoration measures under this final rule is not tied to conditions in the water body. Rather it is tied directly to the performance standards, just as is the performance of the other technologies that facilities may use to meet the standards. While the design and operation of restoration measures will necessarily be linked to conditions in the waterbody (as is also the case for "hard" technologies) the performance standards that restoration measures must meet are not.

6. Authority To Apply CWA Section 316(b) Requirements to Existing Facilities

Some commenters argued that CWA § 316(b) does not apply to existing facilities, but rather authorizes

only a one-time, pre-construction review of cooling water intake structure location, design, construction and capacity.

EPA disagrees with this assertion. CWA section 316(b) applies to "any standard established pursuant to section 1311 [CWA section 301] or 1316 [CWA section 306]." CWA section 301 establishes the statutory authority for EPA to promulgate technology-based standards for effluent discharges from existing sources. Therefore, CWA section 316(b) requirements can, and indeed must, apply to existing facilities. Given that section 316(b) requirements apply to existing facilities, such requirements cannot reasonably be viewed as mandating only a one-time, pre-construction review. Moreover, as the court noted in *Riverkeeper* v. *EPA*, slip op. at 44–45 (2nd Cir. Feb. 3, 2004), "if Congress intended to grandfather in new or modified intake structures as well as the related point sources that discharge heat, it could have done so in section 316(c)."

7. Authority To Regulate "Capacity" of the "Intake Structure" Through Restrictions on Flow Volume

Some commenters asserted that EPA was not authorized to require closed-cycle cooling systems, pointing out that CWA section 316(b) addresses cooling water "intake structures," not cooling systems or cooling operations. EPA's performance standards based on closed-cycle cooling, they argued, constitutes an impermissible restriction of the cooling system or operation, which is not part of the "intake structure" itself. Others asserted that the term "capacity," as used in CWA section 316(b), refers to the size of the cooling water intake

structure, not the volume of flow through the intake. They therefore questioned EPA's authority to regulate flow volume by requiring the use of closed-cycle cooling systems. **[*41630]**

The rule does not in fact require the use of closed-cycle cooling systems. Rather, the rule provides facilities with five different compliance options, only one of which is based on closed-cycle cooling technology. Moreover, EPA is authorized to set performance standards based on closed-cycle cooling technology, as it did in the Phase I rule, which was upheld in *Riverkeeper* v. *EPA*, slip op. (2nd Cir. Feb. 3, 2004). See also Section III.

8. Authority To Determine That Technologies Short of Closed-cycle Cooling Constitute "Best Technology Available To Minimize Adverse Environmental Impact"

Many commenters asserted that closed-cycle cooling is the "best technology available to minimize adverse environmental impact," and that EPA must therefore require facilities to reduce their cooling water intake capacity to a level commensurate with closed-cycle cooling. According to these commenters, this rule violates CWA section 316(b) by adopting performance standards less protective than "best technology available."

EPA reasonably rejected closed-cycle cooling systems as "best technology available" based on consideration of relevant factors, including the costs of closed-cycle cooling, the energy impacts, the relative effectiveness of closed-cycle cooling in minimizing impingement and entrainment in variable waterbodies, and the availability of other

design and control technologies that can be effective in significantly reducing environmental impacts. As the court held in *Riverkeeper* v. *EPA*, slip op. at 29 (2nd Cir. Feb. 3, 2004), "the Clean Water Act allows EPA to make a choice among alternatives based on more than impingement and entrainment." In short, EPA has discretion to consider a variety of factors besides the efficacy of technologies, including cost, and to compare the relative effectiveness of technologies that reduce impingement and entrainment. EPA's weighing of the factors is entitled to a high degree of deference. See also Section III and VII.

9. Authority To Require Implementation of CWA Section 316(b) Through NPDES Permits

Some commenters argued that EPA lacks authority to include section 316(b) requirements in section 402 NPDES permits, because—unlike sections 301, 306, and 402—section 316 regulates "intakes" and not "discharges."

EPA disagrees with this comment. This rule properly requires implementation of CWA section 316 standards through CWA section 402 NPDES permits. CWA section 401(a)(1) authorizes the issuance of NPDES permits for discharges that comply with effluent guidelines limitations under CWA sections 301 and 306. CWA section 316(b) requirements can be implemented through CWA section 402 because they apply to all point sources subject to standards issued under CWA section 310 and 306. See, *U.S. Steel Corp* v. *Train*, 566 F3d 822, 850 (7th Cir. 1977) (finding that CWA implicitly requires that CWA be implemented through NPDES permits). EPA's choice of NPDES permits, which

already reflect CWA sections 301 and 306 effluent limitations, is reasonable.

10. Authority To Implement CWA Requirements Without Compensating Regulated Entities for "Taking" of Property

Several commenters suggest that this rule authorizes an impermissible regulatory taking. Specifically, they argue that the rule requires facilities to limit their intake flows, thus impairing their property rights to the water and entitling them to compensation under the Fifth Amendment to the U.S. Constitution.

EPA notes, however, that the rule does not in fact require a facility to limit its intake flows. Rather, it provides a facility with a variety of compliance options, only one of which is based on flow limitations. While a facility could choose to comply with the requirements by reducing its intake flow to a level commensurate with a closed-cycle cooling system (the first compliance option), it could also select one of the other compliance options that does not require flow restrictions. EPA therefore believes that this rule does not authorize a compensable "taking" of property within the meaning of the Fifth Amendment.

IX. Implementation

As in the Phase I rule, section 316(b) requirements for Phase II existing facilities will be implemented through the NPDES permit program. Today's final rule establishes application requirements in §§ 122.21 and 125.95, monitoring requirements in § 125.96, and record keeping and reporting requirements in § 125.97 for Phase II existing facilities. The

final regulations also require the Director to review application materials submitted by each regulated facility and include monitoring and record keeping requirements in the permit (§ 125.98). EPA will develop a model permit and permitting guidance to assist Directors in implementing these requirements. In addition, the Agency will develop implementtation guidance for owners and operators that will address how to comply with the application requirements, the sampling and monitoring requirements, and the record keeping and reporting requirements in these final regulations.

In this final rule, an existing facility may choose one of five compliance alternatives for establishing best technology available for minimizing adverse environmental impact at the site:

(1) Demonstrate that it will reduce or has reduced its intake flow commensurate with a closed-cycle recirculating system and is therefore deemed to have met the impingement mortality and entrainment performance standards, or that it will reduce or has reduced the design intake velocity of its cooling water intake structure to 0.5 feet per second (ft/s) and is therefore deemed to have met the impingement mortality performance standards;

(2) Demonstrate that its existing design and construction technologies, operational measures, and/or restoration measures meet the performance standards and/or restoration requirements;

(3) Demonstrate that it has selected and will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures that will, in

combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the specified performance standards and/or restoration requirements;

(4) Demonstrate that it meets the applicability criteria for a rule-specified technology or a technology that has been pre-approved by the Director and that it has installed, or will install, and will properly operate and maintain the technology; or,

(5) Demonstrate that it is eligible for a site-specific determination of best technology available to minimize adverse environmental impact and that it has selected, installed, and is properly operating and maintaining, or will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures that the Director has determined to be the best technology available to minimize adverse environmental impact for the facility.

The application, monitoring, record keeping, and reporting requirements for **[*41631]** each of the compliance alternatives are detailed in the following sections.

A. When Does the Final Rule Become Effective?

This rule becomes effective sixty (60) days after the date of publication in the **Federal Register**. After the effective date of the regulation, existing facilities will need to comply when an NPDES permit containing requirements consistent with Subpart J is issued to the facility (see § 125.92). Under current NPDES program regulations, this will occur when an

existing NPDES permit is reissued or, when an existing permit is modified or revoked and reissued. Under today's rule, a facility that is required to comply with this rule within the first four years after the publication date of this rule may request that the Director approve an extended schedule for submitting its Comprehensive Demonstration Study. This schedule must be as expeditious as practicable and not extend beyond three years and 180 days after the publication date of the final rule. The Comprehensive Demonstration Study, once submitted, forms the basis for the Director's determination of specific requirements consistent with Subpart J to be included in the permit. EPA has included this provision to afford facilities time to collect information and perform studies, including pilot studies where necessary, needed to support the development of the Comprehensive Demonstration Study.

Between the time the existing permit expires and the time an NPDES permit containing requirements consistent with this subpart is issued to the facility, permit requirements reflecting the best technology available to minimize adverse environmental impact will continue to be determined based on the Director's best professional judgement.

B. What Information Must I Submit to the Director When I Apply for My Reissued NPDES Permit?

The NPDES regulations governing the permit application process at 40 CFR 122.21 require that facilities currently holding a permit submit an application for permit renewal 180 days prior to the end of the current permit term, which is five years (see § 122.21(d)(2)). If you are the owner or operator

of a facility that is subject to this final rule, you will be required to submit the information specified at 40 CFR 122.21(r)(2), (3), and (5) and all applicable sections of § 125.95, except for the Proposal for Information Collection, with your application for permit reissuance.

The Proposal for Information Collection component of § 125.95 should be submitted to the Director for review and comment prior to the start of information collection activities. For a typical facility that plans to install a technology, it is estimated that a facility would need to submit this Proposal for Information Collection about fifteen (15) months prior to the submission of the remainder of the required information, which is about twenty-one (21) months prior to the expiration of your current permit. This approximate timing is based on the sequential Comprehensive Demonstration Study requirements and the estimated level of effort required to complete the studies and allow time for the Director's review and approval. The timing provided in this section is for illustrative purposes only and represents a schedule that the average facility may need to follow to meet the deadlines established in today's rule. Some facilities may require more, or less time to perform the studies and prepare the application requirements. All facilities, except those that choose to comply with the rule by reducing intake capacity to a level commensurate with a closed-cycle recirculating system in accordance with § 125.94(a)(1)(i), or by adopting a pre-approved technology in accordance with § 125.94(a)(4) must submit a Proposal for Information Collection for review and comment by the Director (§ 125.94(b)(1)). Facilities that comply with impingement mortality

requirements by reducing intake velocity to 0.5 ft/s or less in accordance with § 125.94(a)(1)(ii) will only need to submit a Comprehensive Demonstration Study, including a Proposal for Information Collection, for entrainment reduction requirements, if applicable. The Proposal for Information Collection requirements are detailed later in this section. Figure 1 presents an example of a possible timeframe a facility may follow in preparing and submitting application components.

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[*41632] [Figure 1, Sample Application Timeline, omitted]

Following submission of the Proposal for Information Collection, the Director will review and provide comments on the proposal. During this time, the facility may proceed with planning, assessment, and data collection **[*41633]** activities in fulfillment of Comprehensive Demonstration Study requirements. The Director is encouraged to provide comments expeditiously (*i.e.*, within 60 days) so the permit applicant can make responsive modifications to its information gathering activities.

It is assumed that most facilities would need approximately one year to complete the studies outlined in the Proposal for Information Collection. These must be completed at least 180 days prior to the end of the current permit term, by which time the remainder of required application information must be submitted. If the facility requires more than one year to complete studies described in the Proposal for Information Collection, the facility are encouraged to consult with the Director. Facilities

are also encouraged to consult with the Director regarding their schedule for study completion.

After the first permit containing requirements consistent with Subpart J is issued, facilities may submit a request to their Director soliciting a reduced information collection effort for subsequent permit applications in accordance with § 125.95(a)(3), which allows facilities to demonstrate that the conditions at their facility and within the waterbody in which their intake is located remain substantially unchanged since their previous permit application. The request for reduced cooling water intake structure and waterbody application information must contain a list and justification for each information item in §§ 122.21(r) and 125.95(b) that has not changed since the previous permit application. The applicant must submit this request at least one year prior to the expiration of the current permit term and the Director is required to act on the request within 60 days.

The Director must review and approve the information you provide in your permit application, confirm whether your facility should be regulated as an existing facility under these final regulations, or under Phase III regulations for existing facilities that will be developed in the future, or as a new facility under regulations that were published on December 19, 2001 (66 FR 65256), and confirm the compliance alternative selected (compliance alternatives 1, 2, 3, 4, or 5). Following review and approval of your permit application, the Director will develop a draft permit for public notice and comment. The comment period will allow the facility and other interested parties to review the draft

permit conditions and provide comments to the Director. The Director will consider all public comments received on the draft permit and develop a final permit based upon the application studies submitted and other information submitted during the comment period, as appropriate. The Director will incorporate the relevant requirements for the facility's cooling water intake structure(s) into the final permit.

Today's final rule modifies regulations at 40 CFR 122.21(r) to require Phase II existing facilities to prepare and submit some of the same information required for new facilities. Phase II existing facilities are required to submit two general categories of information when they apply for a reissued NPDES permit: (1) Physical data to characterize the source waterbody in the vicinity where the cooling water intake structures are located (40 CFR 122.21(r)(2)), and data to characterize the design and operation of the cooling water intake structures (40 CFR 122.21(r)(3)). Unlike new facilities, however, Phase II existing facilities are not required to submit the Source Water Baseline Biological Characterization Data required under 40 CFR 122.21(r)(4). Today's final rule adds a new requirement at 40 CFR 122.21(r)(5) to require a facility to submit information describing the design and operating characteristics of its cooling water system(s) and how it/they relate to the cooling water intake structure(s) at the facility.

In addition, today's final rule requires all Phase II existing facilities to submit the information required under consistent with the compliance alternative selected. In general, the final application

requirements in § 125.95 require most Phase II existing facility applicants to submit some or all of the components of a Comprehensive Demonstration Study (§ 125.95(b), see also Exhibit II in section V). As noted in section V, facilities that do not need to conduct a Comprehensive Demonstration Study are those that (1) reduce their flow commensurate with a closed cycle, recirculating cooling system, (2) install a rule-specified or Director-approved technology in accordance with § 125.99 (except that these facilities must still submit a Technology Installation and Operation Plan and Verification Monitoring Plan), or (3) reduce intake velocity to 0.5 ft/s or less (except that these facilities must still submit a Comprehensive Demonstration Study for entrainment requirements, if applicable).

Each component of the Comprehensive Demonstration Study and its applicability is described later in this section. In addition, the requirements for each of the five compliance alternatives are detailed, with respect to which components are required for each alternative.

1. Source Water Physical Data (40 CFR 122.21(r)(2))

Under the final requirements at 40 CFR 122.21(r)(1)(ii), Phase II existing facilities subject to this final rule are required to provide the source water physical data specified at 40 CFR 122.21(r)(2) in their application for a reissued permit. These data are needed to characterize the facility and evaluate the type of waterbody and species potentially affected by the cooling water intake structure. The Director is expected to use this information to evaluate the appropriateness of the design and construction technologies, operational

measures, and/or restoration measures proposed by the applicant.

The applicant is required to submit the following specific data: (1) A narrative description and scaled drawings showing the physical configuration of all source waterbodies used by the facility, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports the facility's determination of the waterbody type where each cooling water intake structure is located; (2) an identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence within the waterbody and the results of such studies; and (3) locational maps.

2. Cooling Water Intake Structure Data (40 CFR 122.21(r)(3))

Under the final requirements at 40 CFR 122.21(r)(1)(ii), Phase II existing facilities are required to submit the data specified at 40 CFR 122.21(r)(3) to characterize the cooling water intake structure which should assist in the evaluation of its potential for impingement and entrainment of aquatic organisms. Information on the design of the intake structure and its location in the water column, in conjunction with biological information, will allow the permit writer to evaluate which species, or life stages of a species, are potentially subject to impingement and entrainment. A diagram of the facility's water balance should be used to identify the proportion of intake water used for cooling, make-up, and process water. The water balance diagram also provides a picture of the total

flow in and out of the facility, **[*41634]** allowing the permit writer to evaluate the suitability of proposed design and construction technologies and/or operational measures.

The applicant is required to submit the following specific data: (1) A narrative description of the configuration of each of its cooling water intake structures and where they are located in the waterbody and in the water column; (2) latitude and longitude in degrees, minutes, and seconds for each of its cooling water intake structures; (3) a narrative description of the operation of each of the cooling water intake structures, including design intake flows, daily hours of operation, number of days of the year in operation, and seasonal operation schedules, if applicable; (4) a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges; and (5) engineering drawings of the cooling water intake structure(s).

3. Cooling Water System Data (40 CFR 122.21(r)(5))

Under the final requirements at 40 CFR 122.21(r)(!)(ii), Phase II existing facilities are required to submit the cooling water system data specified at 40 CFR 122.21(r)(5) to characterize the operation of cooling water systems and their relationship to the cooling water intake structure(s) at the facility. Also required is a narrative description of the proportion of design intake flow that is used in the system, the number of days of the year that the cooling water system is in operation, and any seasonal changes in the operation of the system, if applicable. The facility must also submit design and engineering calculations prepared by a

qualified expert, such as a professional engineer, and supporting data to support the narrative description. This information is expected to be used by the applicant and the Director in determining the appropriate standards that can be applied to the Phase II facility.

4. Comprehensive Demonstration Study (40 CFR 125.95(b))

Final requirements at § 125.95(b) require all existing facilities, except those deemed to have met the performance standards by reducing intake capacity to a level commensurate with the use of a closed-cycle, recirculating cooling water system, or by reducing intake velocity to 0.5 ft/s or less (impingement mortality standards only), or facilities that select an approved technology in accordance with § 125.94(a)(4), to perform and submit to the Director all applicable components of a Comprehensive Demonstration Study, including data and detailed analyses to demonstrate that they will meet applicable requirements in § 125.94(b). As noted in section V, Comprehensive Demonstration Study requirements vary depending on the compliance alternative selected.

The Comprehensive Demonstration Study has seven components:

- Proposal for Information Collection;
- Source Waterbody Flow Information;
- Impingement Mortality and/or Entrainment Characterization Study;
- Technology and Compliance Assessment Information;

- Restoration Plan;
- Information to Support Site-specific Determination of Best Technology Available for Minimizing Adverse Environmental Impact; and
- Verification Monitoring Plan.

All Phase II existing facilities, except those mentioned above, are required to submit at a minimum the following: a Proposal for Information Collection (§ 125.95(b)(1)); Source Waterbody Flow Information (§ 125.95(b)(2)); an Impingement Mortality and/or Entrainment Characterization Study (§ 125.95(b)(3)); and a Verification Monitoring Plan (§ 125.95(b)(7)). Note that facilities selecting restoration measures provide a monitoring plan as part of their Restoration Plan, in accordance with § 125.95(b)(5)(v), rather than a Verification Monitoring Plan in accordance with § 125.95(b)(7). The requirements in these two provisions are similar, but tailored specifically to the monitoring needs of restoration projects, and design and construction technologies and operational measures, respectively. Phase II existing facilities that have reduced their intake velocity to less than or equal to 0.5 ft/s but are still required to reduce entrainment (if the standard applies), must submit only those components of the Impingement Mortality and/or Entrainment Characterization Study pertaining to entrainment, in addition to the other required components of the Comprehensive Demonstration Study. Facilities that are required to meet only the impingement mortality reduction requirements in § 125.94(b), are required to submit a study only for the impingement reduction requirements.

Facilities that comply with applicable requirements either wholly or in part through the use of existing or proposed design and construction technologies or in part through the use of existing or proposed design and construction technologies, and/or operational measures must submit the Technology and Compliance Assessment Information in § 125.95(b)(4), consisting of a Design and Construction Technology Plan (§ 125.95(b)(4)(i)) and a Technology Installation and Operation Plan (§ 125.95(b)(4)(ii)). (Facilities that use a pre-approved technology in accordance with § 125.94(b)(4) need only submit the Technology Installation and Operation Plan.) The Technology Installation and Operation Plan explains how the facility intends to install, operate, maintain, monitor, and adaptively manage the selected technologies to meet the applicable performance standards or site-specific technology requirements, and in most cases will provide the basis for determining compliance with § 125.94(b).

Only those Phase II existing facilities that propose to use restoration measures wholly or in part to meet the performance standards in § 125.94(b) or site-specific requirements developed pursuant to § 125.94(a)(5) are required to submit the Restoration Plan (§ 125.95(b)(5)). This Plan serves an analogous function for restoration measures to that served by the Technology and Compliance Assessment Information for design and construction technologies and operational measures, in that it shows the design of the measures, explains how the facility will construct, maintain, monitor, and adaptively manage the measures to meet applicable performance

standards and/or site specific requirements, and serves as a basis for determining compliance.

Only those Phase II existing facilities who request a site-specific determination of the best technology available are required to submit Information to Support Site-specific Determination of Best Technology Available for Minimizing Adverse Environmental Impact (§ 125.95(b)(6)). Facilities that select the compliance alternative at § 125.94(a)(4) (Approved Technology), are required to submit only two items: the Technology Installation and Operation Plan (§ 125.95(b)(4)(ii)) and the Verification Monitoring Plan (§ 125.95(b)(7)).

a. Proposal for Information Collection

As a facility, you are required to submit to the Director for review and comment, a proposal stating what information will be collected to support the Comprehensive Demonstration Study (see § 125.95(b)(1)). This proposal must provide the following:

- A description of the proposed and/or implemented technology(ies) and/or restoration measures to be evaluated in the study (§ 125.95(b)(1)(i)); **[*41635]**

- A list and description of any historical studies characterizing impingement and entrainment and/or the physical and biological conditions in the vicinity of the cooling water intake structures and their relevance to this proposed study (§ 125.95(b)(1)(ii)). If you propose to use existing data, you must demonstrate the extent to which the data are representative of current conditions and that the

data were collected using appropriate quality assurance/quality control procedures;

- A summary of any past, ongoing, or voluntary consultations with appropriate Federal, State, and Tribal fish and wildlife agencies that are relevant to this study and a copy of written comments received as a result of such consultation (§ 125.95(b)(1)(iii));

- A sampling plan for any new field studies you propose to conduct in order to ensure that you have sufficient data to develop a scientifically valid estimate of impingement and entrainment at your site (§ 125.95(b)(1)(iv)). The sampling plan must document all methods and quality assurance/quality control procedures for sampling and data analysis. The sampling and data analysis methods you propose must be appropriate for a quantitative survey and must take into account the methods used in other studies performed in the source waterbody. Also, the methods must be consistent with any methods required by the Director. The sampling plan must include a description of the study area (including the area of influence of the cooling water intake structure(s)), and provide taxonomic identifications of the sampled or evaluated biological assemblages (including all life stages of fish and shellfish) to the extent this is known in advance and relevant to the development of the plan.

In addition, the proposal should provide other information, where available, that would aid the Director in reviewing and commenting on your plans for conducting the Comprehensive Demonstration Study (*e.g.*, information on how you plan to conduct a Benefits Valuation Study, or gather additional data to support development of a Restoration Plan). EPA

recognizes that in some cases collection and analysis of information will be an iterative process and plans for information collection may change as new data needs are identified. For example, a facility may not be able to design a Benefits Valuation Study and determine what additional data are needed (*e.g.*, quantified information on non-use benefits) until it has first collected and analyzed the data for its Impingement Mortality and/or Entrainment Characterization Study. While the Proposal for Information Collection is only required to be submitted once, EPA encourages permit applicants to consult with the Director as appropriate after the proposal has been submitted, in order to ensure that the Director has complete and appropriate information to develop permit conditions once the permit is submitted.

As stated previously, the proposal for information collection must be submitted prior to the start of information collection activities and should allow sufficient time for review and comment by the Director, although facilities are permitted to begin data collection activities before receiving the Director's comments. Directors are encouraged to provide their comments expeditiously (*i.e.*, within 60 days) to allow facilities time to make responsive modifications in their information collection plans. Adequate time for data collection efforts identified in the proposal for information collection prior to the due date for the permit application should also be scheduled.

b. Source Waterbody Flow Information

Under the requirements at § 125.95(b)(2)(i), Phase II existing facilities (except those that comply with

the rule under § 125.94(a)(1)(i) with cooling water intake structures that withdraw cooling water from freshwater rivers or streams are required to provide the documentation showing the mean annual flow of the waterbody and any supporting documentation and engineering calculations that allow a determination of whether they are withdrawing less than or greater than five (5) percent of the annual mean flow. This will provide information needed to determine whether the entrainment performance standards of § 125.94(b)(2) apply to the facility. Two potential sources of the documentation are publicly available flow data from a nearby U.S. Geological Survey (USGS) gauging station or actual instream flow monitoring data collected by the facility. Representative historical data (from a period of time up to 10 years, if available) must be used to make this determination.

Under § 125.95(b)(2)(ii), Phase II existing facilities with cooling water intake structures that withdraw cooling water from a lake (other than one of the Great Lakes) or reservoir and that propose to increase the facility's design intake flow are required to submit a narrative description of the thermal stratification of the waterbody and any supporting documentation and engineering calculations showing that the increased total design intake flow meets the requirement to not disrupt the natural thermal stratification or turnover pattern (where present) of the source water in a way that adversely impacts fisheries, including the results of any consultations with Federal, State, or Tribal fish or wildlife management agencies. Typically, this natural thermal stratification will be defined by the thermocline, which may be affected to a certain

extent by the withdrawal of cooler water and the discharge of heated water into the system. If increased total design intake flow is proposed, and disruption of the natural thermal stratification is a positive or neutral impact, the facility should include this information with the data submitted in this section.

c. Impingement Mortality and/or Entrainment Characterization Study (§ 125.95(b)(3))

The final regulations require that you submit the results of an Impingement Mortality and/or Entrainment Characterization Study in accordance with § 125.95(b)(3). If your facility has reduced its design, through-screen intake velocity to less than or equal to 0.5 ft/s, you are not required to submit the impingement mortality component of this study (§ 125.95(a)(1)(ii)). Facilities whose capacity utilization rate is less than 15 percent, facilities that withdraw cooling water only from a lake or reservoir other than one of the Great Lakes, and those facilities that withdraw less than 5 percent of the mean annual flow of a freshwater river or stream would only be required to submit the impingement mortality component of this study because no performance standards for entrainment apply. This Impingement Mortality and Entrainment characterization must include the following: (1) Taxonomic identifications of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment; (2) a characterization of all life stages of fish, shellfish,

and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) identified in the taxonomic identification noted above, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s), based on sufficient data to characterize annual, seasonal, and diel variations in impingement mortality and entrainment (*e.g.*, related to climate and weather differences, spawning, feeding and water column migration); and (3) **[*41636]** documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) identified above and an estimate of impingement mortality and entrainment to be used as the calculation baseline. The documentation may include historical data that are representative of the current operation of your facility and of biological conditions at the site. This information must be provided in sufficient detail to support development of the other elements of the Comprehensive Demonstration Study. Thus, while the taxonomic identification in item 1 will need to be fairly comprehensive, the quantitative data required in items 2 and 3 may be more focused on species of concern, and/or species for which data are available.

Impingement mortality and entrainment samples to support the calculations required by the Design and Construction Technology Plan and Restoration Plan must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented. EPA recommends

that the facility coordinate a review of its list of threatened, endangered, or other protected species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, or other relevant agencies to ensure that potential impacts to these species have been evaluated.

d. Technology and Compliance Assessment Information (§ 125.95(b)(4))

The Technology and Compliance Assessment Information required under § 125.95(b)(4) is comprised of two parts: (1) The Design and Construction Technology Plan; and (2) the Technology Installation and Operation Plan. If you plan to utilize the compliance alternative in § 125.94(a)(4), you need only submit the Technology Installation and Operation Plan. If you plan to utilize the compliance alternative in § 125.94(a)(2) or (3) using design and construction technologies and/or operational measures (either existing or new), you must submit both parts. Note that facilities seeking a site-specific determination of BTA in accordance with § 125.94(a)(5), must submit a Site-Specific Technology Plan in accordance with § 125.95(b)(6)(iii) rather than a Design and Construction Technology Plan. The two plans contain similar requirements, but are tailored to the compliance alternative selected. Facilities seeking a site-specific determination of the best technology available must submit a Technology Installation and Operation Plan along with their Site-Specific Technology Plan.

The Design and Construction Technology Plan must explain the technologies or operational

measures selected by a facility to meet the requirements in § 125.94(a)(2) and (3). The Agency recognizes that selection of the specific technology or group of technologies for your site will depend on individual facility and waterbody conditions. Examples of appropriate technologies may include, but are not limited to, wedgewire screens, fine mesh screens, fish handling and return systems, barrier nets, aquatic filter barrier systems, and enlargement of the cooling water intake structure to reduce velocity. Examples of operational measures include, but are not limited to, seasonal shutdowns or reductions in flow, and continuous or more frequent rotation of travelling screens. Information required as part of your Design and Construction Technology Plan includes the following: (1) capacity utilization rate for your facility (or for individual intake structures where appropriate) and supporting data, including average annual net generation of the facility in megawatt hours (MWh) as measured over a five-year period (if available) of representative operating conditions and the total net capacity of the facility in megawatts (MW) and calculations (§ 125.95(b)(4)(i)); (2) a narrative description of the design and operation of all design and construction technologies and/or operational measures that you have or will put into place to meet the performance standards for reduction of impingement mortality of those species most susceptible to impingement, and information that demonstrates the efficacy of those technologies and/or operational measures for those species; (3) a description of the design and operation of all design and construction technologies or operational measures that you have or will put into place, to meet the performance standards for

reduction of entrainment for those species most susceptible to entrainment, if applicable to your facility, and information that demonstrates the efficacy of those technologies and/or operational measures for those species; (4) calculations of the reduction in impingement mortality and/or entrainment of all life stages of fish and shellfish that would be achieved by the technologies and/or operational measures you have selected based on the Impingement Mortality and/or Entrainment Characterization Study in § 125.95(b)(3); and (5) design and engineering calculations, drawings, and estimates to support the narrative descriptions required in the Design and Construction Technology Plan prepared by a qualified expert such as a professional engineer.

If your facility has multiple intake structures and each is dedicated exclusively to the cooling water needs of one of more generating units, you may calculate the capacity utilization rate separately for each structure, for purposes of determining whether entrainment reduction performance standards are applicable. Note that you would still be required to consider the total design intake flow at all structures combined in determining whether your design intake flow exceeds 5 percent of the mean annual flow of a freshwater river or stream. If your capacity utilization rate, for either a single intake structure or the facility as a whole, is 15 percent or greater based on the historical 5 year annual average, but you make a binding commitment to the Director to maintain your capacity utilization rate below 15 percent for the duration of the permit, you may base your capacity utilization rate determination on that commitment.

In determining compliance with any requirements to reduce impingement mortality or entrainment, you must assess the total reduction in impingement mortality and entrainment against the calculation baseline developed under the Impingement Mortality and Entrainment Characterization Study (§ 125.95(b)(3)). The calculation baseline is defined at § 125.93 as an estimate of impingement mortality and entrainment that would occur at your site assuming (1) The cooling water intake system has been designed as a once-through system; (2) the opening of the cooling water intake structure is located at, and the face of the standard 3/8-inch mesh traveling screen is oriented parallel to, the shoreline near the surface of the source waterbody; and (3) the baseline practices, procedures, and structural configuration are those that the facility would maintain in the absence of any structural or operational controls, including flow or velocity reductions, implemented in whole or in part for the purposes of reducing impingement mortality and entrainment. You may also choose to use your facility's current level of impingement mortality and entrainment as the calculation baseline. EPA has previously referred to this as the "as-built approach." Reductions in impingement mortality and entrainment **[*41637]** from the calculation baseline as a result of any design and construction technologies and/or operational measures already implemented at your facility should be added to the reductions expected to be achieved by any additional design and construction technologies and operational measures that will be implemented in order to meet the applicable performance standards (§ 125.95(b)(4)(i)(C)). In this case, the calculation

baseline could be estimated by evaluating existing data from a facility nearby without impingement and/or entrainment control technology (if relevant) or by evaluating the abundance of organisms in the source waterbody in the vicinity of the intake structure that may be susceptible to impingement and/or entrainment. Additionally, if a portion of the total design intake flow is water withdrawn for a closed-cycle, recirculating cooling system (but flow is not sufficiently reduced to satisfy the compliance option in § 125.94(a)(1)(i)), such facilities may use the reduction in impingement mortality and entrainment that is attributed to the reduction in flow in meeting the performance standards in § 125.94(b). The calculation baseline may be estimated using: historical impingement mortality and entrainment data from your facility or from another facility with comparable design, operational, and environmental conditions; current biological data collected in the waterbody in the vicinity of your cooling water intake structure; or current impingement mortality and entrainment data collected at your facility. A facility may request that the calculation baseline be modified to be based on a location of the opening of the cooling water intake structure at a depth other than at or near the surface if they can demonstrate to the Director that the other depth would correspond to a higher baseline level of impingement mortality and/or entrainment.

The Technology Installation and Operation Plan is required for all facilities that choose the compliance alternative in § 125.94(a)(2), (3), (4), or (5), propose to use design and construction technologies and/or operational measures (either existing or new) to meet performance standards or site specific

requirements. Such facilities must submit the following information to the Director for review and approval: (1) A schedule for the installation and maintenance of any new design and construction technologies; (2) a list of the operational parameters that will be monitored, including the location and the frequency at which you will monitor them; (3) a list of activities you will undertake to ensure to the degree practicable the efficacy of the installed design and construction technologies and operational measures, and the schedule for implementing them; (4) a schedule and methodology for assessing the efficacy of any installed design and construction technologies and operational measures in achieving applicable performance standards, including an adaptive management plan for revising design and construction technologies and/or operational technologies if your assessment indicates that applicable performance standards are not being met; and (5) for facilities that select a pre-approved technology in accordance with § 125.94(a)(4), documentation that appropriate site conditions (as specified by EPA or the Director in accordance with § 125.99) exist at your facility. In developing the schedule for installation and maintenance of any new design and construction technologies in item 1, you should schedule any downtime to coincide with otherwise necessary downtime (*e.g.*, for repair, overhaul, or routine maintenance of the generating units) to the extent practicable. Where additional downtime is required, you may coordinate scheduling of this downtime with the North American Electric Reliability Council and/or other generators in your area to ensure that impacts to energy reliability and supply are minimized. The Director should approve

any reasonable scheduling provision included for this purpose. Those facilities that propose to use restoration measures must submit the Restoration Plan required at § 125.95(b)(5).

Today's final rule requires the Director to evaluate, using information submitted in your application, bi-annual status reports, and any other available information, the performance of any technologies, operational measures, and/or restoration measures you may have implemented in previous permit terms. Additional or different design and construction technologies, operational measures, and/or restoration measures may be required if the Director determines that the initial technologies, operational measures, and/or restoration measures you selected and implemented will not meet the requirements of § 125.94(b) and (c), as provided in § 125.98(b)(1)(i). The rule also requires that your permit contain a condition requiring your facility to reduce impingement mortality and entrainment commensurate with the efficacy of the installed design and construction technologies and/or operational measures. This is designed to ensure that technologies are operated and maintained to ensure their efficacy to the degree practicable, and not merely to meet the low end of the applicable performance standard range, if better performance is practicable. The Technology Installation and Operation Plan is one of the most important pieces of documentation for implementing the requirements of this final rule. It serves to (1) guide facilities in the installation, operation, maintenance, monitoring, and adaptive management of selected design and construction technologies and/or operational measures; (2) provide a schedule and methodology

for assessing success in meeting applicable performance standards and site-specific requirements; and (3) provide a basis for determining compliance with the requirements of § 125.91(a)(2)–(5). Facilities and Directors are encouraged to take appropriate care in developing, reviewing and approving the plan. Note that for facilities employing restoration measures, the Restoration Plan serves the same required functions.

e. Restoration Plan (§ 125.95(b)(5))

EPA views restoration measures as part of the "design" of a cooling water intake structure, and considers restoration measures one of several technologies that may be employed, in combination with others, to minimize adverse environmental impact. The consideration of restoration measures is relevant to the section 316(b) determination of the requisite design of cooling water intake structures because restoration measures help minimize the adverse environmental impact attributable to such structures. Facilities may use restoration measures that produce and/or result in levels of fish and shellfish in the facility's waterbody or watershed that are substantially similar to those that would result through compliance with the applicable performance standards or alternative site-specific requirements. In order to employ restoration measures, the facility must demonstrate to the Director that it has evaluated the use of design and construction technologies and/or operational measures and determined that the use of restoration measures is appropriate because meeting the applicable performance standards or site-specific requirements through the use of design and construction

technologies and/or operational measures alone is less feasible, less cost-effective or less environmentally desireable than meeting the standards in whole or in part through the use of restoration measures. Facilities must **[*41638]** also demonstrate to the Director that the restoration measures, alone or in combination with any feasible design and construction technologies and/or restoration measures, will produce ecological benefits and maintain fish and shellfish in the waterbody, including community structure and function, at a substantially similar level to that which would be achieved by meeting the applicable performance standards at § 125.94(b) or the site-specific requirements developed pursuant to § 125.94(a)(5). The Director must approve any use of restoration measures.

To help all parties review the proposed or existing restoration measures and to help ensure adequate performance of those measures, § 125.95(b)(5) requires facilities proposing to use restoration measures to submit a Restoration Plan with their applications to the Director for review and approval. In the submittal, the facility must address species identified, in consultation with Federal, State, and Tribal fish and wildlife management agencies with responsibility for fisheries and wildlife potentially affected by its the facility's cooling water intake structures, as species of concern. The level of complexity of the Restoration Plan likely will be commensurate with the restoration measures considered or proposed.

First, the facility must demonstrate that it has evaluated the use of design and construction

technologies and/or operational measures and explain how it determined that the use of restoration measures would be more feasible, cost-effective, or environmentally desirable than meeting the applicable performance standards or site-specific requirements wholly through the use of design and construction technologies, and/or operational measures.

Second, the facility must submit a narrative description of the design and operation of all restoration measures the facility has in place or has selected and proposes to implement to produce fish and shellfish. If the ecological benefits from an existing restoration project are required to compensate for some environmental impact other than the impact from impingement and entrainment by the cooling water intake structure (*e.g.*, a wetland created to satisfy section 404 of the Clean Water Act requirements), those ecological benefits should not be counted towards meeting the applicable performance standards or site-specific requirements. The narrative description should identify the species targeted under any restoration measures.

Third, the facility must submit a quantification of the ecological benefits of the existing and/or proposed restoration measures. The facility must estimate the reduction in fish and shellfish impingement mortality and entrainment that would be necessary to comply with applicable performance standards or site-specific requirements, using information from the Impingement Mortality and Entrainment Characterization Study and any other available and appropriate information. The facility must then calculate the production of fish and shellfish from

existing and proposed restoration measures. The quantification must also include a discussion of the nature and magnitude of uncertainty associated with the performance of the restoration measures and a discussion of the time frame within which ecological benefits are expected to accrue from the restoration project.

Fourth, the facility must provide design calculations, drawings, and estimates documenting that the proposed restoration measures, in combination with design and construction technologies and/or operational measures, or alone, will meet the requirements for production of fish and shellfish. Production of fish and shellfish as a result of relevant restoration measures already implemented at the facility should be added to the production expected to be achieved by the additional restoration measures. If the restoration measures address the same fish and shellfish species identified in the Impingement Mortality and Entrainment Characterization Study (in-kind restoration), the facility must demonstrate that the restoration measures will produce a level of these fish and shellfish substantially similar to that which would result from meeting applicable performance standards or site-specific requirements. In this case, the calculations should include a site-specific evaluation of the suitability of the restoration measures based on the species that are found at the site. If the restoration measures address fish and shellfish species different from those identified in the Impingement Mortality and Entrainment Characterization Study (out-of-kind restoration), the facility must demonstrate that the restoration measures produce ecological benefits substantially

similar to or greater than those that would be realized through in-kind restoration. Such a demonstration should be based on a watershed approach to restoration planning and consider applicable multi-agency watershed restoration plans, site-specific peer-reviewed ecological studies, and/or consultation with appropriate Federal, State, and Tribal natural resource agencies. While both in-kind and out-of-kind restoration require a quantification of the levels of fish and shellfish the restoration measures are expected to produce, out-of-kind restoration may include a qualitative demonstration that these ecological benefits are substantially similar to or greater than those that would be realized through in-kind restoration, because different species are being produced that may not be directly comparable to those identified in the Impingement Mortality and/or Entrainment Characterization Study.

Fifth, the facility must submit a plan utilizing an adaptive management method for implementing, maintaining, and demonstrating the efficacy of the restoration measures it has selected and for determining the extent to which restoration measures, or the restoration measures in combination with design and construction technologies and operational measures, have met the applicable performance standards or site-specific requirements. Adaptive management is a process in which a facility chooses an approach for meeting a project goal, monitors the effectiveness of that approach, and then, based on monitoring and any other available information, makes any adjustments necessary to ensure continued progress toward the

project's goal. This cycle is repeated as necessary until the goal is met.

The adaptive management plan must include (1) A monitoring plan that includes a list of the restoration parameters that the facility will monitor, the frequency at which they will be monitored, and the success criteria for each parameter; (2) a list of activities the facility will undertake to ensure the efficacy of the restoration measures, a description of the linkages between these activities and the items described in the monitoring plan, and an implementation schedule for the activities; and (3) a process for revising the restoration plan as new information, including monitoring data, becomes available, and if the applicable performance standards or site-specific requirements are not being met.

Sixth, the facility must submit a summary of any past or ongoing consultation with Federal, State, and Tribal fish and wildlife management agencies on its use of restoration measures, including any written comments received as a result of such consultations.

Seventh, if requested by the Director, the facility must conduct a peer review **[*41639]** of items to be submitted as part of the Restoration Plan. Written comments from peer reviewers must be submitted to the Director and made available to the public as part of the permit application. Peer reviewers must be selected in consultation with the Director who may consult with EPA, Federal, State and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by the facility's cooling water intake structure(s). Peer reviewers must have appropriate qualifications (*e.g.*, in the

fields of geology, engineering and/or biology) depending upon the materials to be reviewed.

Finally, the facility must include in the Plan a description of information to be included in a status report to the Director every two years. The final regulations at § 125.98(b)(1)(ii) require that this information be reviewed by the Director to determine whether the proposed restoration measures, in conjunction with (or in lieu of) design and construction technologies and/or operational measures, will meet the applicable performance standards or site-specific requirements, or, if the restoration is out-of-kind, will produce ecological benefits (fish and shellfish) including maintenance or protection of community structure and function in your facility's waterbody or watershed.

f. Compliance Using a Pre-approved Technology (§ 125.94(a)(4))

If you choose to comply with the fourth compliance alternative, you must submit documentation to the Director that your facility meets the appropriate site conditions and you have installed and will properly operate and maintain submerged cylindrical wedgewire screen technology (as described in § 125.99(a)(1)) or other technologies as approved by the Director under § 125.99(b)). If you are subject to impingement mortality performance standards only, and plan to install wedgewire screens with a maximum through-screen design intake velocity of 0.5 ft/s or less, you should choose the compliance alternative in § 125.94(a)(1)(i), and do not need to demonstrate that you meet the other criteria in § 125.99(a)(1) or prepare a Technology Installation and Operation Plan or Verification Monitoring Plan.

Facilities subject to entrainment performance standards seeking compliance under this alternative must submit a Technology Installation and Operation Plan and a Verification Monitoring Plan that address entrainment reduction, and document that all of the appropriate site conditions in § 125.99(a)(1) exist at their facility. To qualify for compliance using the cylindrical wedgewire screen technology, your facility must meet the following conditions: (1) Your cooling water intake structure is located in a freshwater river or stream; (2) your cooling water intake structure is situated such that sufficient ambient counter-currents exist to promote cleaning of the screen face; (3) your maximum through-screen design intake velocity is 0.5 ft/s or less; (4) the slot size is appropriate for the size of eggs, larvae, and juveniles of all fish and shellfish to be protected at the site; and (5) your entire main condenser cooling water flow is directed through the technology. Note that small flows totalling less than 2 MGD for auxiliary plant cooling do not necessarily have to be included. Facilities should demonstrate that they meet these criteria in the Technology Installation and Operation Plan.

In addition, any interested person may submit a request that a technology be approved for use in accordance with the compliance alternative in § 125.94(a)(4). If the Director approves, the technology may be used by all facilities that have similar site conditions under the Director's jurisdiction. To do this, the interested person must submit the following as required by § 125.99(b): (1) A detailed description of the technology; (2) a list of design criteria for the technology and site characteristics and conditions that each facility must

have in order to ensure that the technology can consistently meet the appropriate impingement mortality and entrainment performance standards in § 125.94(b); and (3) information and data sufficient to demonstrate that all facilities under the jurisdiction of the Director can meet the applicable impingement mortality and entrainment performance standards in if the applicable design criteria and site characteristics and conditions are present at the facility.

EPA has adopted this compliance alternative in response to comments suggesting that EPA provide an additional, more streamlined compliance option under which a facility could implement certain specified technologies that are deemed highly protective in exchange for reducing the scope of the Comprehensive Demonstration Study. (See, 68 FR 13522, 13539; March 19, 2003).

g. Verification Monitoring Plan (§ 125.95(b)(7))

Finally, § 125.95(b))7) requires all Phase II existing facilities complying under § 125.94(a)(2), (3), (4), or (5) using design and construction technologies and/or operational measures, to submit a Verification Monitoring Plan to measure the efficacy of the implemented design and construction technologies and/or operational measures. The plan must include at least two years of monitoring to verify the full-scale performance of the proposed or already implemented design and construction technologies and/or operational measures. Note that verification monitoring is also required for restoration measures but the requirements for this monitoring are included as part of the Restoration Plan in

§ 125.95(b)(5)(v). Components of the Verification Monitoring Plan must include:

(i) Description of the frequency and duration of monitoring, the parameters to be monitored, and the basis for determining the parameters and the frequency and duration of monitoring. The parameters selected and the duration and frequency of monitoring must be consistent with any methodology for assessing success in meeting applicable performance standards in your Technology Installation and Operation Plan as required by § 125.95(b)(4)(ii);

(ii) A proposal on how naturally moribund fish and shellfish that enter the cooling water intake structure would be identified and taken into account in assessing success in meeting the performance standards in § 125.94(b); and,

(iii) A description of the information to be included in a bi-annual status report to the Director.

The facility and the Director will use the results of verification monitoring to assess the facility's success in meeting the performance standards for impingement mortality and entrainment reduction or alternate site-specific requirements and to guide adaptive management in accordance with the requirements in the facility's Technology Installation and Operation Plan. Restoration monitoring is discussed separately under § 125.95(b)(5)(v). Verification monitoring is required to begin once the technologies and/or operational measures are implemented and continue for a sufficient period of time (but at least two years) to assess success in reducing impingement mortality and entrainment.

C. How Will the Director Determine the Appropriate Cooling Water Intake Structure Requirements?

Initially, the Director must determine whether the facility is covered by this rule. If the answer to all the following **[*41640]** questions is yes, the facility will be required to comply with the requirements of this final rule (§ 125.91).

- Is the facility a point source?

- Does the facility use or propose to use a cooling water intake structure(s) with a total design intake flow of 50 million gallons per day (MGD) or more to withdraw cooling water from waters of the United States?

- As its primary activity, does the facility both generate and transmit electric power or generate electric power but sell it to another entity for transmission?

- Is at least 25 percent of the water withdrawn used solely for cooling purposes?

In the case of a Phase II existing facility that is co-located with a manufacturing facility, only that portion of the cooling water intake flow that is used by the Phase II facility to generate electricity for sale to another entity will be considered for purposes of determining the 50 MGD and 25 percent criteria.

Use of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with one or more independent suppliers of cooling water if the supplier withdraws water from waters of the United States (except as provided below) but is not itself a Phase II existing facility. This provision is intended to prevent circumvention

of these requirements by creating arrangements to receive cooling water from an entity that is not itself a Phase II existing facility. However, for purposes of this provision, a public water system or any entity that sells treated effluent to be used as cooling water is not a "supplier." Thus, obtaining cooling water from a public water system or treated effluent used as cooling water does not constitute use of a cooling water intake structure. This rule is not intended to discourage the beneficial reuse of treated effluent, nor is it intended to impose requirements on public water systems.

Permit Application Review

The Director must review the application materials submitted under § 122.21(r) and § 125.95 and determine the appropriate performance standards to apply to the facility and approve a set of design and construction technologies, operational measures, and/or restoration measures to meet these standards. The first step is to review the Proposal for Information Collection and determine if the technologies, operational measures, and/or restoration measures to be evaluated seem appropriate for the site and if the data gathering activities (including the sampling plan) seem adequate to support the development of the other components of the Comprehensive Demonstration Study, including impingement mortality and entrainment estimates. The Director will also review any existing data submitted. The Director must review and provide comment on the Proposal for Information Collection; however, a facility may proceed with planning, assessment, and data collection activities in fulfillment of Comprehensive

Demonstration Study requirements prior to receiving comments from the Director. The Director is encouraged to provide comments expeditiously (*i.e.*, within 60 days) so the facility can make responsive modifications to its information collection plans.

If a facility submits a request in accordance with § 125.95(a)(3) to reduce information about its cooling water intake structures and the source waterbody required to be submitted in its permit application (other than for the first permit term after promulgation of this rule, for which complete information is required), the Director must approve the request within 60 days if conditions at the facility and in the waterbody remain substantially unchanged since the facility's previous application.

The Director must also review all information submitted under § 122.21(r)(2), (3), and (5) and § 125.95, as appropriate, to determine appropriate permit conditions based on the requirements in this subpart. At each permit renewal, or more frequently as appropriate, the Director must assess success in meeting applicable performance standards, restoration requirements, and/or alternate site-specific requirements.

At each permit renewal, the Director must review the application materials and monitoring data to determine whether additional requirements should be included in the permit to meet the applicable performance standards. Additional requirements may include, but are not limited to, additional design and construction technologies, operational measures, and/or restoration measures, improved operation and maintenance of existing technologies and measures, and/or increased monitoring.

Permitting Requirements

Following consideration of the information submitted by the Phase II existing facility in its NPDES permit application, the Director must determine the appropriate requirements and conditions to include in the permit based on the compliance alternatives in § 125.94(a) for establishing best technology available chosen by the facility. The following requirements must be included in each permit:

(1) *Cooling Water Intake Structure Requirements.* Requirements that implement the applicable provisions of § 125.94 must be included in the permit conditions. To accomplish this, the Director must evaluate the performance of the design and construction technologies, operational measures, and/or restoration measures proposed and implemented by the facility and require additional or different design and construction technologies, operational measure, and/or restoration measures, and/or improved operation and maintenance of existing technologies and measures, if needed to meet the applicable impingement mortality and entrainment performance standards, restoration requirements for fish and shellfish production, or alternate site-specific requirements.

In determining compliance with the performance standards for facilities proposing to increase withdrawals of cooling water from a lake (other than a Great Lake) or a reservoir in § 125.94(b)(3), the Director must consider anthropogenic factors (those not considered "natural") unrelated to the Phase II existing facility's cooling water intake structures that can influence the occurrence and location of a

thermocline. Anthropogenic factors may include source water inflows, other water withdrawals, managed water uses, wastewater discharges, and flow/level management practices (*e.g.*, some reservoirs release water from deeper bottom layers). The Director must coordinate with appropriate Federal, State, or Tribal fish and wildlife agencies to determine if any disruption of the natural thermal stratification resulting from the increased withdrawal of cooling water does not adversely affect the management of fisheries.

To develop appropriate requirements for the cooling water intake structure(s), the Director must do the following:

(i) Review and approve the Design and Construction Technology Plan required in § 125.95(b)(4) to evaluate the suitability and feasibility of the design and construction technology and/or operational measures proposed to meet the performance standards of § 125.94(b), or site-specific requirements developed pursuant to § 125.94(a)(5);

(ii) If the facility proposes restoration measures in accordance with § 125.94(c), review and approve the Restoration Plan required under § 125.95(b)(5) to determine whether the proposed measures, alone or in **[*41641]** combination with design and construction technologies and/or operational measures, will meet the requirements under § 125.94(c);

(iii) In each reissued permit, include a condition in the permit requiring the facility to reduce impingement mortality and entrainment (or to increase fish and shellfish production, if applicable)

commensurate with the efficacy at the facility of the installed design and construction technologies, operational measures, and/or restoration measures;

(iv) If the facility implements design and construction technologies and/or operational measures and requests that compliance with the requirements of § 125.94 be measured for the first permit (or subsequent permit terms, if applicable) employing the Technology Installation and Operation Plan in accordance with § 125.94(b)(4)(ii), the Director must review and approve the plan and require the facility to meet the terms of the plan including any revisions to the plan that may be necessary if applicable performance standards or site-specific requirements are not being met. If the facility implements restorations measures and requests that compliance with the requirements in § 125.94 be measured for the first permit term (or subsequent permit terms, if applicable) employing a Restoration Plan in accordance with § 125.95(b)(5), the Director must review and approve the plan and require the facility to meet the terms of the plan including any revision to the plan that may be necessary if applicable performance standards or site-specific requirements are not being met. In determining whether to approve a Technology Installation and Operation Plan or Restoration Plan, the Director must evaluate whether the design and construction technologies, operational measures, and/or restoration measures the facility has installed, or proposes to install, can reasonably be expected to meet the applicable performance standards in § 125.94(b), restoration requirements in § 125.94(c)(2), and/or alternative site-specific requirements established pursuant to § 125.94(a)(5),

and whether the Technology Installation and Operation Plan and/or Restoration Plan complies with the applicable requirements of § 125.95(b). In reviewing the Technology Installation and Operation Plan, the Director must approve any reasonable scheduling provisions that are designed to ensure that impacts to energy reliability and supply are minimized, in accordance with § 125.95(b)(4)(ii)(A). If the facility does not request that compliance with the requirements in § 125.95(b) be measured employing a Technology Installation and Operation Plan and/or Restoration Plan, or the facility has not been in compliance with the terms of its current Technology Installation and Operation Plan and/or Restoration Plan during the preceding permit term, the Director must require the facility to comply with the applicable performance standards in § 125.94(b), restoration requirement in § 125.94(c)(2), and/or alternative site-specific requirements developed pursuant to § 125.94(a)(5). In considering a permit application, the Director must review the performance of the design and construction technologies, operational measures, and/or restoration measures implemented and require additional or different design and construction technologies, operational measures, and/or restoration measures, and/or improved operation and maintenance of existing technologies and measures, if needed to meet the applicable performance standards, restoration requirements, and/or alternative site-specific requirements.

(v) Review and approve the proposed Verification Monitoring Plan submitted under § 125.95(b)(7) (for design and construction technologies) and/or monitoring provisions of the Restoration Plan

submitted under § 125.95(b)(5)(v) and require that the monitoring continue for a sufficient period of time to demonstrate whether the design and construction technology, operational measures, and/or restoration measures meet the applicable performance standards in § 125.94(b), restoration requirements in § 125.94(c)(2) and/or site-specific requirements established pursuant to § 125.94(a)(5);

(vi) If a facility requests requirements based on a site-specific determination of best technology available for minimizing adverse environmental impact, the Director must review the application materials submitted under § 125.95(b)(6) and any other information submitted, including quantitative and qualitative benefits, that would be relevant to a determination of whether alternative requirements are appropriate for the facility. If a facility submits a study to support entrainment survival at the facility, the Director must review and approve the results of that study. If the Director determines that alternative requirements are appropriate, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact in accordance with § 125.94(a)(5). The Director may request revisions to the information submitted by the facility in accordance with § 125.95(b)(6) if it does not provide an adequate basis to make this determination. Any site-specific requirements established based on new and/or existing design and construction technologies, operational measures, and/or restoration measures, must achieve an efficacy that is, in the Director's judgement, as close as practicable to the applicable performance standards without resulting in costs that are significantly greater than the costs

considered by the Administrator for a like facility to achieve the applicable performance standards or the benefits of complying with the applicable performance standards in § 125.94(b);

(vii) The Director must review information on the proposed methods for assessing success in meeting applicable performance standards and/or restoration requirements submitted by the facility under § 125.95(b)(4)(ii)(D) and/or (b)(5)(v)(A), evaluate those and other available methods, and specify how success in meeting the performance standards and/or restoration requirements must be determined including the averaging period for determining the percent reduction in impingement mortality and entrainment and/or the production of fish and shellfish. Compliance for facilities who request that compliance be measured employing a Technology Installation and Operation Plan and/or Restoration Plan must be determined in accordance with § 125.98(b)(1)(iv).

(2) *Monitoring Conditions.* The Director must require the facility to perform monitoring in accordance with the Technology Installation and Operation Plan in § 125.95(b)(4)(ii), the Restoration Plan required by § 125.95(b)(5), if applicable, and the Verification Monitoring Plan required by § 125.95(b)(7). In determining any additional applicable monitoring requirements in accordance with § 125.96, the Director must consider the monitoring facility's Verification Monitoring, Technology Installation and Operation, and/or Restoration Plans, as appropriate. The Director may modify the monitoring program based on changes in

physical or biological conditions in the vicinity of the cooling water intake structure.

(3) *Record Keeping and Reporting.* At a minimum, the permit must require the facility to report and keep records specified in § 125.97.

(4) *Pre-Approved Design and Construction Technologies.* Section 125.94(a)(4) offers facilities the choice of adopting a protective, pre-approved design and construction technology, and preparing a significantly streamlined Comprehensive Demonstration Study. Section 125.99 lists one pre-approved **[*41642]** technology (wedgewire screens) and provides an opportunity for the Director to pre-approve other technologies.

For a facility that chooses to demonstrate that they have installed and properly operate and maintain a design and construction technology approved in accordance with , the Director must review and approve the information submitted in the Technology Installation and Operation Plan in § 125.95(b)(4)(ii) and determine if they meet the criteria in § 125.99.

If a person/facility requests approval of a technology under § 125.99(b), the Director must review and approve the information submitted and determine its suitability for widespread use at facilities with similar site conditions in its jurisdiction with minimal study. The Director must evaluate the adequacy of the technology when installed in accordance with the required design criteria and site conditions to consistently meet the performance standards in § 125.94(b). The Director may only approve a technology following public

notice and consideration of comment regarding such approval.

(5) *Bi-Annual Status Report.* The Director must specify monitoring data and other information to be included in a status report every two years. The other information may include operation and maintenance records, summaries of adaptive management activities, or any other information that is relevant to determining compliance with the terms of the facility's Technology Installation and Operation Plan and/or Restoration Plan.

D. What Will I Be Required To Monitor?

Section 125.96 of today's final rule provides that Phase II existing facilities must perform monitoring in accordance with the Verification Monitoring Plan required by § 125.95(b)(7), the Technology Installation and Operation Plan required by § 125.95(b)(4)(ii), if applicable, the Restoration Plan required by § 125.95(b)(5), and any additional monitoring specified by the Director to demonstrate compliance with the applicable requirements of § 125.94. In developing monitoring conditions, the Director should consider the need for biological monitoring data, including impingement and entrainment sampling data sufficient to assess the presence, abundance, life stages (including eggs, larvae, juveniles, and adults), and mortality of aquatic organisms (fish and shellfish or other organisms required to be monitored by the Director) impinged or entrained during operation of the cooling water intake structure. This type of data may be used to develop permit conditions to implement the requirements of this rule. The Director should ensure, where appropriate, that any

required monitoring will allow for the detection of any annual, seasonal, and diel variations in the species and numbers of individuals that are impinged or entrained.

The Director may modify the monitoring program based on changes in physical or biological conditions in the vicinity of the cooling water intake structure. The Director may also require monitoring of operational parameters for facilities that employ a Technology Installation and Operation Plan or Restoration Plan to comply with the requirements of . The Director must specify what monitoring or other data is to be included in a status report every two years.

E. How Will Compliance Be Determined?

This final rule will be implemented by the Director placing conditions consistent with the requirements of this part in NPDES permits. A facility may demonstrate compliance by meeting the performance standards in § 125.94(b) applicable to the facility. The application information, including components of the Comprehensive Demonstration Study, as appropriate, should demonstrate that the facility is already meeting the performance standards, or that it will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures to meet the performance standards, or that a site-specific determination of best technology available is necessary. To support this demonstration, the facility should submit the following information to the Director:

- Data submitted with the NPDES permit application to show that the facility meets location, design, construction, and capacity requirements consistent with the compliance alternative selected;

- Data to demonstrate that the facility is meeting the performance standards consistent with the compliance alternative selected;

- Compliance monitoring data and records as prescribed by the Director.

The specifics of how success in meeting the performance standards shall be measured (*i.e.*, the number of species, whether critical species or all species) and the method of measurement (*e.g.*, total biomass, total counts, etc.) must be determined by the Director based on review of the proposed methodology submitted by the facility in its Technology Installation and Operation Plan and/or Restoration Plan, and any other methods the Director considers appropriate.

Alternatively, the facility may request that compliance be determined based on whether it has complied with the construction, operational, maintenance, monitoring, and adaptive management requirements of its Technology Installation and Operation Plan (for design and construction technologies and/or operational measures) or Restoration Plan (for restoration measures). In this case, the facility must still assess success in meeting applicable performance standards or restoration requirements but this assessment serves to guide the adaptive management process rather than as a basis for determining compliance. After the first permit term following promulgation of this subpart,

facilities are only eligible for this compliance determination alternative if they have been in compliance with the terms of their Technology Installation and Operation Plan and/or Restoration Plan during the preceding permit term. Under this compliance determination alternative, the Technology Installation and Operation Plan or Restoration Plan must specify construction, operational, maintenance, monitoring, and adaptive management requirements that can reasonably be expected to achieve success in meeting the applicable performance standards, restoration requirements and/or site-specific requirements. These construction, operational, maintenance, monitoring, and adaptive management requirements must also be approved by the Director, who will also specify what monitoring data and other information must be included in the facility's biannual status report.

The required elements of the Technology Installation and Operation Plan include (1) a schedule for installation and maintenance of any new technologies; (2) operational parameters to be monitored; (3) activities to ensure the efficacy of technologies and measures; (4) a schedule and methodology for assessing the efficacy of installed technologies and measures in meeting the performance standards; (5) an adaptive management plan; and (6) for facilities using a pre-approved compliance technology, documentation that they meet the conditions for its use. The Restoration Plan requires corresponding information as appropriate for restoration measures.

EPA believes that it is important for facilities to consider and document each of the components of the

Technology [*41643] Installation and Operation Plan, regardless of which compliance determination approach is used. However, the level of detail appropriate for some of the components may be different for the two different approaches. For facilities that comply by demonstrating success in meeting performance standards, particularly in cases where they are already meeting the standards and no significant changes in technologies or operations are needed, brief summaries may be sufficient for most components, though they will still need detailed documentation of their schedule and methodology for assessing efficacy of installed technologies and measures for meeting the standards. Conversely, for facilities where compliance is determined based on whether they have complied with the construction, operation, maintenance, monitoring, and adaptive management approaches required in the Technology Installation and Operation Plan or Restoration Plan, a fairly detailed specification of these requirements will be appropriate. The Director should ensure that the level of detail in the Technology Installation and Operation Plan or Restoration Plan is sufficient to support whichever compliance determination approach is selected.

Section 125.97 requires existing facilities to keep records and report monitoring data and other information specified by the Director in a bi-annual status report although Directors may require more frequent reports. Facilities must also keep records of all data used to complete the permit application and show compliance with the requirements of § 125.94, any supplemental information developed under § 125.95, and any compliance monitoring data submitted under § 125.96, for a period of at least

three (3) years from date of permit issuance. The Director may require that these records be kept for a longer period.

F. What Are the Respective Federal, State, and Tribal Roles?

Today's final regulations amend 40 CFR 123.25(a)(36) to add a requirement that authorized State and Tribal programs have sufficient legal authority to implement today's requirements (40 CFR part 125, subpart J). Therefore, today's final rule affects authorized State and Tribal NPDES permit programs. Under 40 CFR 123.62(e), any existing approved section 402 permitting program must be revised to be consistent with new program requirements within one year from the date of promulgation, unless the NPDES-authorized State or Tribe must amend or enact a statute to make the required revisions. If a State or Tribe must amend or enact a statute to conform with today's final rule, the revision must be made within two years of promulgation. States and Tribes seeking new EPA authorization to implement the NPDES program must comply with the requirements when authorization is approved. This final regulation does not alter State authority under section 510 of the Clean Water Act.

EPA recognizes that some States have invested considerable effort in developing and implementing section 316(B) regulatory programs. This final regulation allows States to use these programs to fulfill section 316(b) requirements where the State demonstrates to the Administrator that such programs will achieve comparable environmental performance. Specifically, the final rule allows any

State to demonstrate to the Administrator that it has adopted alternative regulatory requirements in its NPDES program that will result in environmental performance within each relevant watershed that is comparable to the reductions in impingement mortality and entrainment that would otherwise be achieved under § 125.94.

In addition to updating their programs to be consistent with today's final rule, States and Tribes authorized to implement the NPDES program are required under NPDES State program requirements to implement the cooling water intake structure requirements of subpart J following promulgation of the final regulations. The permit requirements in this final rule must be implemented upon the first issuance or reissuance of permits following promulgation.

Duties of an authorized State or Tribe under this regulation may include:

- Review and verification of permit application materials, including a permit applicant's determination of source waterbody classification and the flow of a freshwater river or stream at the point of the intake;

- Determination of the performance standards in that apply to the facility;

- Verification of a permit applicant's determination of whether it meets or exceeds the applicable performance standards;

- Verification that a permit applicant's Technology and Compliance Assessment Information, including the Design and Construction Technology Plan and Technology Installation and Operation Plan.

demonstrates that the proposed technologies and measures will reduce the impacts to fish and shellfish to levels required;

- Verification that a permit applicant is eligible for site-specific requirements, and if so, development of site-specific requirements that achieve an efficacy as close as practicable to the applicable performance standards;

- Verification that the Technology Installation and Operation Plan can reasonably be expected to meet performance standards or alternative site-specific requirements;

- Verify that the facility meets the requirements of the approved compliance alternative it selected;

- Verify that any Restoration Plan meets all applicable requirements;

- Verify that the Verification Monitoring Plan is sufficient to assess technology efficacy;

- Development of draft and final NPDES permit conditions for the applicant implementing applicable requirements pursuant to this rule including whether compliance with the requirements of will be determined based on success in meeting applicable performance standards or based on complying with a Technology Installation and Operation Plan or Restoration Plan; and,

- Ensuring compliance with permit conditions based on requirements.

EPA will implement these requirements where States or Tribes are not authorized to implement the NPDES program. EPA also will implement these requirements where States or Tribes are authorized

to implement the NPDES program but do not have sufficient authority to implement these requirements.

G. Are Permits for Existing Facilities Subject to Requirements Under Other Federal Statutes?

EPA's NPDES permitting regulations at 40 CFR 122.49 contain a list of Federal laws that might apply to Federally issued NPDES permits. These include the Wild and Scenic Rivers Act, 16 U.S.C. 1273 *et seq.*; the National Historic Preservation Act of 1966, 16 U.S.C. 470 *et seq.*; the Endangered Species Act, 16 U.S.C. 1531 *et seq.*; the Coastal Zone Management Act, 16 U.S.C. 1451 *et seq.*; and the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.* See 40 CFR 122.49 for a brief description of each of these laws. In addition, the provisions of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq.*, relating to essential fish habitat might be relevant. Nothing in this final rulemaking authorizes activities that are not in compliance **[*41644]** with these or other applicable Federal laws (*e.g.*, Marine Mammal Protection Act, 16 U.S.C. 1361 *et seq.*, and Migratory Bird Treaty Act, 16 U.S.C. 703 *et seq.*).

H. Alternative Site-Specific Requirements

Under § 125.94(a)(5), an existing facility may demonstrate to the Director that it has selected, installed, and is properly operating and maintaining, or will install and properly operate and maintain, design and construction technologies, operational measures, and/or restoration measures that the Director determines to be the best technology available to minimize adverse environmental impact

for the facility based on the cost-cost test specified in sub-section (a)(5)(i) or the cost-benefit test specified in (a)(5)(ii) of the rule.

Section 125.94(a)(5)(i) provides that an existing facility may demonstrate that the costs of compliance under the compliance alternatives in § 125.94(a)(2) through (4) of the rule would be significantly greater than the costs considered by the Administrator for a like facility in establishing the applicable performance standards. In such cases, the Director must make a site-specific determination of the best technology available for minimizing adverse environmental impact. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that is, in the judgment of the Director, as close as practicable to the applicable performance standards in § 125.94(b) of the rule.

Section 125.94(a)(5)(ii) provides that an existing facility may demonstrate that the costs of compliance under alternatives in § 125.94(a)(2) through (4) of the rule would be significantly greater than the benefits of complying with the applicable performance standards at that facility. In such cases, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that, in the judgment of the Director, is as close as

practicable to the applicable performance standards in § 125.94(b) of the rule.

1. Facility's Costs Significantly Greater Than Costs Considered by EPA

If the Director determines that data specific to your facility indicate that the costs of compliance under § 125.94(a)(2) through (4) would be significantly greater than the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards in § 125.94(b) you may request a site-specific determination of best technology available for minimizing adverse environmental impacts. A facility requesting this determination must submit a Comprehensive Cost Evaluation Study (§ 125.94(b)(6)(i)) and a Site Specific Technology Plan (§ 125.94(b)(6)(iii)). The Comprehensive Cost Evaluation Study must include engineering cost estimates in sufficient detail to document the costs of implementing design and construction technologies, operational measures, and/or restoration measures at the facility that would be needed to meet the applicable performance standards of § 125.94(b); a demonstration that the documented costs significantly exceed the costs considered by EPA for a facility like yours in establishing the applicable performance standards; and engineering cost estimates in sufficient detail to document the costs of implementing alternative design and construction technologies, operational measures, and/or restoration measures in the facility's Site-Specific Technology Plan developed in accordance with § 125.94(b)(6)(iii).

To make the demonstration that compliance costs are significantly greater than those considered by

EPA, the facility must first determine its actual compliance costs. To do this, the facility first should determine the costs for any new design and construction technologies, operational measures, and/or restoration measures that would be needed to comply with the requirements of § 125.94(a)(2) through (4), which may include the following cost categories: The installed capital cost of the technologies or measures, the net operation and maintenance (O&M) costs for the technologies or measures (that is, the O&M costs for the final suite of technologies and measures once all new technologies and measures have been installed less the O&M costs of any existing technologies and measures), the net revenue losses (lost revenues minus saved variable costs) associated with net construction downtime (actual construction downtime minus that portion which would have been needed anyway for repair, overhaul or maintenance) and any pilot study costs associated with on-site verification and/or optimization of the technologies or measures. Costs should be annualized using a 7 percent discount rate, with an amortization period of 10 years for capital costs and 30 years for pilot study costs and construction downtime net revenue losses. Annualized costs should be converted to 2002 dollars ($2002), using the engineering news record construction cost index (see *Engineering News-Record*. New York: McGraw Hill. Annual average value is 6538 for year 2002). Costs for permitting and post-construction monitoring should not be included in this estimate, as these are not included in the EPA-estimated costs against which they will be compared, as described below. Because existing facilities already incur monitoring and permitting

costs, and these are largely independent of the specific performance standards adopted and technologies selected to meet them, EPA believes it is both simpler and more appropriate to conduct the cost comparison required in this provision using direct compliance costs (capital, net O&M, net construction downtime, and pilot study) only. Adding permitting and monitoring costs to both sides of the comparison would complicate the methodology without substantially changing the results.

To calculate the costs that the Administrator considered for a like facility in establishing the applicable performance standards, the facility must follow the steps laid out below, based on the information in the table provided in Appendix A: Costs considered by EPA in Establishing Performance Standards. A sample of the table is provided below (see sample table). Note that those facilities that claimed the flow data that they submitted to EPA, and which EPA used to calculate compliance costs, as confidential business information (CBI), are not listed in the table provided in Appendix A, unless the total calculated compliance costs were zero. If these facilities wish to request a site-specific determination of best technology available based on significantly greater compliance costs, they will need to waive their claim of confidentiality prior to submitting the Comprehensive Cost Evaluation Study so that EPA can make the necessary data available to the facility, Director, and public. **[*41645]**

SAMPLE TABLE.—COSTS CONSIDERED BY EPA IN ESTABLISHING PERFORMANCE STANDARDS ($2002)

[omitted]

[*41646] The data in Appendix A is keyed to both a facility name and survey ID number. Facilities should be able to determine their ID number from the survey they submitted to EPA during the rule development process.

Step 1: Determine which technology EPA modeled as the most appropriate compliance technology for your facility (§ 125.95(a)(5)(i)(A)). To do this, use the code in column 12 of Appendix A to look up the modeled technology in Table 9-1 below.

TABLE 9-1.—TECHNOLOGY CODES AND DESCRIPTIONS

Technology Codes	Technology description
1	Addition of fish handling and return system to an existing traveling screen system.
2	Addition of fine-mesh screens to an existing traveling screen system.
3	Addition of a new, larger intake with fine-mesh and fish handling and return system in front of an existing intake system.
4	Addition of passive fine-mesh screen system (cylindrical wedgewire) near shoreline with mesh width of 1.75 mm.
5	Addition of a fish net barrier system.
6	Addition of an aquatic filter barrier system.

TABLE 9-1.—TECHNOLOGY CODES AND DESCRIPTIONS

Technology Codes	Technology description
7	Relocation of an existing intake to a submerged offshore location with passive fine-mesh screen inlet with mesh width of 1.75 mm.
8	Addition of a velocity cap inlet to an existing offshore intake.
9	Addition of passive fine-mesh screen to an existing offshore intake with mesh width of 1.75 mm.
10	[Module 10 not used].
11	Addition of dual-entry, single-exit traveling screens (with fine-mesh) to a shoreline intake system.
12	Addition of passive fine-mesh screen system (cylindrical wedgewire) near shoreline with mesh width of 0.76 mm.
13	Addition of passive fine-mesh screen to an existing offshore intake with mesh width of 0.76 mm.
14	Relocation of an existing intake to a submerged offshore location with passive fine-mesh screen inlet with mesh width of 0.76 mm.

Step 2: Using EPA's costing equations, calculate the annualized capital and net operation and

maintenance costs for a facility with your design flow using this technology (§ 125.94(a)(5)(i)(B)). To do this, you should use the following formula, which is derived from the results of EPA's costing equations for a facility like yours using the selected technology:

$$y_f = y_{epa} + m * (x_f - x_{epa}),(1)$$

Where:

y_f = annualized capital and net O&M costs using actual facility design intake flow,

x_f = actual facility design intake flow (in gallons per minute),

x_{epa} = EPA assumed facility design intake flow (in gallons per minute) (column 3),

y_{epa} = Annualized capital and net O&M costs using EPA design intake flow (column 7),and

m = design flow adjustment slope (column 13).

Rather than providing the detailed costing equations that EPA used to calculate annualized capital and net O&M costs for facilities to use each of the 14 modeled technologies, EPA has provided the simplified formula above, which collapses the results of those equations for the particular facility and technology into a single result (y_{epa}) and then allows the facility to adjust this result to reflect its actual design intake flow, using a technology specific slope for a facility like yours that is derived from the costing equations. This allows facilities to perform the flow adjustment required by § 125.94(a)(5)(i)(B) in a straightforward and transparent manner. Facilities, Directors, or members of the public who wish to review the detailed costing equations should

consult the Technical Development Document, Chapter 3.

EPA has provided some additional information in Appendix A, beyond that which is needed to perform the calculations in § 125.94(a)(5)(ii), to facilitate comparison of the results obtained using formula 1 to the detailed costing equations in the TDD, for those who wish to do so. EPA does not expect facilities or permit writers to do this, and has in fact provided the simplified formula to preclude the need for doing so, but is providing the additional information to increase transparency. Thus, for informational purposes, the total capital cost (not annualized), baseline O&M cost, and post construction O&M cost from which the annualized capital and net O&M costs using EPA design intake flow (y_{epa} in column 7) are derived are listed separately in columns 4 through 6. To calculate y_{epa}, EPA annualized the total capital cost using a 7 percent discount rate and 10 year amortization period, and added the result to the difference between the post construction O&M costs and the baseline O&M costs.

Note that some entries in Appendix A have NA indicated for the EPA assumed design intake flow in column 2. These are facilities for which EPA projected that they would already meet otherwise applicable performance standards based on existing technologies and measures. EPA projected zero compliance costs for these facilities, irrespective of design intake flow, so no flow adjustment is needed. These facilities should use $0 as their value for the costs considered by EPA for a like facility in establishing the applicable performance standards. EPA recognizes that these facilities will still incur

permitting and monitoring costs, but these are not included in the cost comparison for the reasons stated above.

Step 3: Determine the annualized net revenue loss associated with net construction downtime that EPA modeled for the facility to install the technology (§ 125.94(a)(5)(i)(C)) and the annualized pilot study costs that EPA modeled for the facility to test and optimize the technology (§ 125.94(a)(5)(i)(D)). The sum of these two figures is listed in column 10. For informational purposes, the total (not annualized) net revenue losses from construction downtime, and total (not annualized) pilot study costs are listed separately in columns 8 and 9. These two figures were annualized using a 7 percent discount rate and 30 year amortization period and the results added together to get the annualized facility downtime and pilot study costs in column 10.

Step 4: Add the annualized capital and O&M costs using actual facility design intake flow (y_f from step 2), and the annualized facility downtime and pilot study costs (column 10 from step 3) to get the preliminary costs considered by EPA for a facility like yours (§ 125.94(a)(5)(i)(E)).

Step 5: Determine which performance standards in § 125.94(b)(1) and (2) (*i.e.*, impingement mortality only, or impingement mortality and entrainment) are applicable to your facility, and compare these to the performance standards on which EPA's cost estimates are based, listed in column 11 (§ 125.94(a)(5)(i)(F)). If the applicable performance standards and those on which EPA's cost estimates are based are the same, then the preliminary costs considered by EPA for a facility like yours are the

final costs considered by EPA for a facility like yours. If only the impingement mortality performance standards are applicable to your facility, but EPA based its cost estimates on **[*41647]** impingement mortality and entrainment performance standards, then you should divide the preliminary costs by a factor of 2.148 to get the final costs. If impingement mortality and entrainment performance standards are applicable to your facility, but EPA based its cost estimates on impingement mortality performance standards only, then you should multiply the preliminary costs by 2.148 to get the final costs. In calculating compliance costs, EPA projected what performance standards would be applicable to the facility based on available data. However, because of both variability and uncertainty in the underlying parameters that determine which performance standards apply (*e.g.*, capacity utilization rate, mean annual flow), it is possible that in some cases the performance standards that EPA projected are not correct. The adjustment factor of 2.148 was determined by taking the ratio of median compliance costs for facilities to meet impingement mortality and entrainment performance standards over median compliance costs for facilities to meet impingement mortality performance standards only. While using this adjustment factor will not necessarily yield the exact compliance costs that EPA would have calculated had it had current information, EPA believes the results are accurate enough for determining whether a facility's actual compliance costs are "significantly greater than" the costs considered by EPA for a like facility in establishing the applicable performance standards. EPA believes it is preferable to provide a simple and

transparent methodology for making this adjustment that yields reasonably accurate results, rather than a much more complex methodology that would be difficult to use and understand (for the facility, Director, and public), even if the more complex methodology would yield slightly more accurate results.

The Site-Specific Technology Plan is developed based on the results of the Comprehensive Cost Evaluation Study and must contain the following information:

- A narrative description of the design and operation of all existing and proposed design and construction technologies, operational measures, and/or restoration measures that you have selected in accordance with § 125.94(a)(5);

- An engineering estimate of the efficacy of the proposed and/or implemented design and construction technologies or operational measures, and/or restoration measures. This estimate must include a site-specific evaluation of the suitability of the technologies or operational measures for reducing impingement mortality and/or entrainment (as applicable) of all life stages of fish and shellfish based on representative studies (*e.g.*, studies that have been conducted at cooling water intake structures located in the same waterbody type with similar biological characteristics) and, if applicable, site-specific technology prototype or pilot studies. If restoration measures will be used, you must provide a Restoration Plan that includes the elements described in § 125.95(b)(5);

• A demonstration that the proposed and/or implemented design and construction technologies, operational measures, and/or restoration measures achieve an efficacy that is as close as practicable to the applicable performance standards of § 125.94(b) without resulting in costs significantly greater than either the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards, or as appropriate, the benefits of complying with the applicable performance standards at your facility; and,

• Design and engineering calculations, drawings, and estimates prepared by a qualified professional to support the elements of the Plan.

2. Facility's Costs Significantly Greater Than the Benefits of Complying With Performance Standards

A facility demonstrating that its costs are significantly greater than the benefits of complying with performance standards must perform and submit a Comprehensive Cost Evaluation Study, a Benefits Valuation Study, and a Site-Specific Technology Plan.

The Comprehensive Cost Evaluation Study is discussed in the previous section. It requires the same information for a cost-benefit site-specific determination as for a cost-cost site-specific determination, except that the demonstration in § 125.95(b)(6)(i)(B) must show that the facility's actual compliance costs significantly exceed the benefits of meeting the applicable performance standards at the facility.

The Benefits Valuation Study requires that a facility use a comprehensive methodology to fully

value the impacts of impingement mortality and entrainment at its site and the benefits of complying with the applicable performance standards. In addition to the valuation estimates, the benefit study must include the following:

- A description of the methodology(ies) used to value commercial, recreational, and ecological benefits (including any non-use benefits, if applicable);

- Documentation of the basis for any assumptions and quantitative estimates. If you plan to use an entrainment survival rate other than zero, you must submit a determination of entrainment survival at your facility based on a study approved by the Director;

- An analysis of the effects of significant sources of uncertainty on the results of the study;

- If requested by the Director, a peer review of the items you submit in the Benefits Valuation Study. You must choose the peer reviewers in consultation with the Director who may consult with EPA and Federal, State, and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by your cooling water intake structure. Peer reviewers must have appropriate qualifications depending upon the materials to be reviewed.

- A narrative description of any non-monetized benefits that would be realized at your site if you were to meet the applicable performance standards and a qualitative assessment of their magnitude and significance.

All benefits, whether expressed qualitatively or quantitatively, should be addressed in the Benefits Valuation Study and considered by the Director in determining whether compliance costs significantly exceed benefits.

The benefits assessment should begin with an impingement and entrainment mortality study, which quantifies both the baseline mortality as well as the expected change from rule compliance. The benefits assessment should include a qualitative and/or quantitative description of the benefits that would be produced by compliance with the applicable performance standards at the facility site and, to the extent feasible, monetized (dollar) estimates of all significant benefits categories using well established and generally accepted valuation methodologies. The first benefit category to consider is use benefits, which includes such benefits as those to commercial and recreational fishermen. Well-established revealed preference and market proxy methods exist for valuing use benefits, and these should be used in all cases where the impingement and entrainment mortality study identifies substantial impacts to harvested or other relevant species.

The second benefit category to consider is non-use benefits. Non-use benefits may arise from reduced impacts to ecological resources that the public considers important, such as threatened and endangered species. Non-use benefits can generally only be monetized through the use of stated **[*41648]** preference methods. When determining whether to monetize non-use benefits, permittees and permit writers should consider the magnitude and character of the ecological impacts implied by the results of the

impingement and entrainment mortality study and any other relevant information.

- In cases where an impingement mortality and entrainment characterization study identifies substantial harm to a threatened or endangered species, to the sustainability of populations of important species of fish, shellfish or wildlife, or to the maintenance of community structure and function in a facility's waterbody or watershed, non-use benefits should be monetized.[50]

- In cases where an impingement mortality and entrainment characterization study does not identify substantial harm to a threatened or endangered species, to the sustainability of populations of important species of fish, shellfish or wildlife, or to the maintenance of community structure and function in a facility's waterbody or watershed, monetization is not necessary.

Permittees should consult with their permitting authority regarding their plans for assessing ecological and non-use benefits, including whether they plan to conduct a stated preference study and if so, the basic design of the study, including such items as target population, sampling strategy, approximate sample size, general survey design, and other relevant information. When conducting quantitative benefits assessments, permittees should carefully review and follow accepted best practices

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[50] In cases where harm cannot be clearly explained to the public, monetization is not feasible because stated preference methods are not reliable when the environmental improvement being valued cannot be characterized in a meaningful way for survey respondents.

for such studies. A discussion of best practices regarding valuation can be found in EPA's Guidelines for Preparing Economic Analyses (EPA 2000, EPA 240-R-00-003, September 2000) and OMB Circular A-4: Regulatory Analysis (September 17, 2003, *www.whitehouse.gov/omb/inforeg/circular_a4.pdf*). In their benefits assessment, the permittee should present the results, as well as clearly describe the methods used, the assumptions made, and the associated uncertainties.

It is recommended that the permittee and Director seek peer review of the major biological and economic aspects of the final benefits assessment. The goal of the peer review process is to ensure that scientific and technical work products receive appropriate levels of critical scrutiny from independent scientific and technical experts as part of the overall decision-making process. In designing and implementing peer reviews, permittees and permit writers can look to EPA's Science Policy Council Handbook—Peer Review (EPA 100-B-98-00, January 1998, *www.epa.gov*) for guidance.

The Site-Specific Technology Plan is described in the previous section. It requires the same information for a cost-benefit site-specific determination as for a cost-cost site-specific determination, except that the demonstration in § 125.95(b)(6)(iii)(C) must show that the proposed and/or implemented technologies and measures achieve an efficacy that is as close as practicable to the applicable performance standards without resulting in costs significantly greater than the benefits of complying with the applicable performance standards at your facility.

X. Engineering Cost Analysis

A. Technology Cost Modules

In the Notice of Data Availability (NODA) (68 FR 13522, March 19, 2003), the Agency presented an approach for developing compliance costs that included a broad range of compliance technologies for calculating compliance costs as opposed to the approach used for the proposal, which was based on a limited set of technologies. In response to comments, EPA revised the costing modules that were presented in the NODA and used to develop the engineering costs for the final rule. Modifications made include adding a new set of costing modules to address the installation of fine-mesh wedgewire screens with open mesh sizes less than 1 mm in width; revising construction down time needed to relocate cooling water intake structures offshore; and reconsidering the applicability of the double-entry, single-exit technology and its ability to compensate for through-screen velocity issues for fine-mesh applications.

The following modules were used to develop compliance costs for the Agency's engineering cost analysis for the final rule:

- Addition of fish handling and return system to an existing traveling screen system;

- Addition of fine-mesh screens (both with and without a fish handling and return system) to an existing traveling screen system;

- Addition of a new, larger intake in front of an existing intake screen system;

- Addition of passive fine-mesh screen system (cylindrical wedgewire) near shoreline with mesh width of 1.75 mm;
- Addition of passive fine-mesh screen system (cylindrical wedgewire) near shoreline with mesh width of 0.76 mm;
- Addition of a fish net barrier system;
- Addition of an aquatic filter barrier system;
- Relocation of an existing intake to a submerged offshore location (with velocity cap inlet, passive fine-mesh screen inlet with mesh width of 1.75 mm, passive fine-mesh screen inlet with mesh width of 0.76 mm, or onshore traveling screens);
- Addition of a velocity cap inlet to an existing offshore intake;
- Addition of passive fine-mesh screen to an existing offshore intake with mesh width of 1.75 mm;
- Addition of passive fine-mesh screen to an existing offshore intake with mesh width of 0.76 mm;
- Addition or modification of a shoreline-based traveling screen for an offshore intake system; and
- Addition of dual-entry, single-exit traveling screens (with fine-mesh) to a shoreline intake system.

Further explanation and derivation of each of these costing modules and their application for the purposes of assessing costs is discussed in the Technical Development Document. For explanation of how the Agency applied these technology cost modules to determine compliance costs, see section X.B below.

B. Model Facility Cost Development

In order to implement the technology costing modules discussed in section X.A, the Agency used the same basic approach which was described in the NODA for the estimation of costs at the model facility level. This approach focuses as much as possible on site-specific characteristics for which the Agency obtained data through the section 316(b) questionnaires. In addition, EPA used available geographic information, including detailed topographic mapping and overhead satellite imagery, to better utilize site-specific characteristics of each model facility's intake(s) to determine the appropriate costing modules for that facility. The Agency also utilized facility-specific information collected for the regional benefits studies to further inform the selection of compliance technology at model facilities. The Technical Development Document provides the background and a more detailed explanation of the **[*41649]** Agency's approach to model facility level costing, which has not changed dramatically from that published in the NODA (68 FR 13522).

EPA's approach to model facility-level costing may be described as follows. In order to project upgrades to technologies as a result of compliance with today's final rule, the Agency utilized as much information as was available about the characteristics of the facilities expected to be within the scope of the rule. By incorporating as many site-specific features as possible into the design and implementation of its costing approach, the Agency has been able to capture a representative range of compliance costs at what it deems "model facilities." However, it is

infeasible for the Agency to visit and study in detail all of the engineering aspects of each facility complying with this rule (over 400 facilities could incur technology-related compliance costs as a result of this rule). Therefore, although the Agency has developed costs that represent EPA's best effort to develop a site-specific engineering assessment for a particular facility, this assessment does not address any site-specific characteristics that only long-term study of each facility would reveal. Hence, the Agency refers to its approach as a "model" facility approach.

In selecting technology modules for each model facility, EPA, to a degree departed from its traditional least cost approach. The least cost approach, traditionally utilized for estimating compliance technology choices, relies on the principle that the complying plant will choose to install the least cost technology that meets the minimum standard. While the Agency is confident that the suite of available technologies can achieve the performance standards on § 125.94(b) generally, EPA lacks sufficient data to determine the precise performance of each technology on a site-specific basis for over 400 different applications. The Agency thus selected, based on criteria published in the NODA, one of a set of best performing technologies (rather than the least costly technology) that was suitable for each model facility (or intake), in order to ensure that the technology on which costs were based would in fact achieve compliance at that model site. The criteria for selecting the best performing technology for a model facility (or intake) utilized questionnaire data as the primary tool in the assessment. For those facilities utilizing

recirculating cooling systems in-place, the Agency assigned no compliance actions as they met the standards at baseline. The Agency then determined those intakes (facilities) that met compliance requirements with technologies in-place. These facilities received no capital or annual operating and maintenance compliance upgrade costs (although they may receive administrative or monitoring costs). The Agency categorized facilities according to waterbody type from which they withdraw cooling water. The Agency then sorted the intakes (facilities) within each waterbody type based on their configuration as reported in the questionnaires. Generally, the categories of intakes within one waterbody type are as follows: canal/channel, bay/embayment/cove, shoreline, and offshore. Once the intake (facility) is classified to this level the Agency examines the type of technology in-place and compares that against the compliance requirements of the particular intake (facility). For the case of entrainment requirements, the intake technologies (outside of recirculating cooling) that qualify to meet the requirements at baseline are fine mesh screen systems, and combinations of far-offshore inlets with passive intakes or fish handling/return systems. A small subset of intakes has entrainment qualifying technologies in-place at baseline (for the purposes of this costing effort). Therefore, in the case of entrainment requirements, most facilities with the requirement would receive technology upgrades. The methodology for choosing these entrainment technologies is explained further on in this discussion. For the case of impingement requirements, there are a variety of intake technologies that qualify (for the purposes of this

costing effort) to meet the requirements at baseline. The intake types meeting impingement requirements at baseline include the following: barrier net (the only fish diversion system which qualifies), passive intakes (of a variety of types), and fish handling and return systems. A significant number of intakes (facilities) have impingement technology in-place that meets the qualifications for this costing effort. Therefore, some intakes (facilities) require no technology upgrades when only impingement requirements apply. For facilities that do not pre-qualify for impingement and/or entrainment technology in-place (for the purposes of this costing effort), the Agency focuses next on questionnaire data relating to the intake type—canal/channel, bay/embayment/cove, shoreline, and offshore. Within each intake type, the Agency further classifies according to certain specific characteristics. For the case of bays, embayments, and coves, the Agency determined if the intake is flush, protruding, or recessed from shoreline. For the case of canals and channels, the Agency similarly focuses on whether the intake is flush, protruding, or recessed from a shoreline. For the case of shoreline intakes, the Agency necessarily assessed whether the intake is flush, protruding, or recessed. For the case of offshore intakes, the Agency examines whether or not the intake has an onshore terminus (or well) and assesses the characteristics of the onshore system. The information the Agency gathers up to this point is sufficient to narrow down the likely technology applications for each intake (facility). However, in order to determine the best technology application, the Agency also utilizes commercially available satellite images and maps where available. The use

of the satellite images and maps aided the Agency in determining the potential for the construction of expanded intakes in-front of existing intakes and the potential for an intake modification to protrude into the waterbody (such as a near-shore t-screen) due to the degree of navigational traffic in the near vicinity of the intake and whether a protrusion might be tolerated, the possibility of installing a barrier net system, obvious signs of strong currents, the relative distance of a potentially relocated intake inlet, the possibility for fish return installations of moderate length, etc. The Agency was able to collect satellite images for most intakes (facilities) for which it required the resource. However, in some cases (especially those in the rural, mid-western U.S.), only maps were available. Hence, for the case of a significant number facilities located near small freshwater rivers/streams and lakes/reservoirs, the Agency utilized only the questionnaire data and the overhead maps available.

Once the Agency gathered the intake (facility) specific information to this degree, the applicable list of technologies for each intake was small (and in some cases only one technology would apply). Therefore, the Agency examined any other sources of information, such as those obtained for the regional benefits studies, to further narrow down the best technology to meet the requirements of the rule for each model intake (facility). Often, the decision was between just two or three potential technologies. If there was no evidence in the Agency's possession to suggest that the least-cost technology would not function, then the Agency would select this technology. However, should evidence imply that the least cost technology not be able to function reliably

or have a feasibility issue **[*41650]** related to site deployment (for example, a barrier net across a navigable waterway or a fish handling and return system with an extremely long return trough), then the Agency departed from the "least-cost" decision process and assigned the "best-performing" technology. In cases where more than one technology still remained after ruling out a least-cost alternative due to evidence (which was a rare occurrence), then the Agency attempted to balance the application of the remaining technologies about a median, thereby assigning moderately high costs for some cases and moderately low costs in others. Therefore, for the case of national costs, the Agency's application of technology cost modules reflect a reasonable national average.

C. Facility Flow Modifications

In developing costs and benefits for the NODA, the Agency revised intake flow information for a small subset of inscope facilities in an effort to ensure the accuracy and quality of the data. In developing costs and benefits for the final rule, the Agency has further refined the intake flow information used.

Since the NODA, the Agency re-evaluated its original decision to use the reported 1998 (the most recent of three years collected) annual flows for Detailed Questionnaire (DQ) recipients for the calculation of benefits. This, in turn, had an impact on the development of estimated design intake flows for short-technical questionnaire (STQ) recipients. As presented in the NODA, the Agency estimated design intake flows for STQ facilities using a statistical methodology based on linear regression of DQ recipients' annual intake flows and DQ

recipients' design intake flows to assess the design intake flow information for facilities that responded to the short technical questionnaire. Because the Agency asked STQ respondents for only their actual annual intake flow for the 1998 reporting year only (or a typical operational year), it was necessary to calculate design intake flow information for the purpose of accurately assessing compliance costs. Therefore, for the NODA and proposal, the Agency calculated design intake flows for STQ facilities based on a model derived from only the 1998 DQ flow data. In retrospect, the Agency determined that a more robust approach would be to use all three years of annual DQ flows collected (1996–1998) and to take advantage of the statistical abilities afforded by the expanded data set (that is, to determine and exclude outliers). Hence, for this final rule, the Agency has estimated the costs and benefits of the rule using improved flow data over the NODA and proposal. For the case of STQ facilities, the Agency has utilized an improved data set for the calculation of design intake flows, and, in turn, the calculation of compliance costs.

XI. Economic Analysis

A. Final Rule Costs

EPA estimates that the final rule will have total annualized social (pre-tax) costs of $389 million ($2002). Of this total, $385 million are direct costs incurred by facilities and $4 million are implementation costs incurred by State and Federal government. On a post-tax basis, direct costs incurred by facilities subject to the final rule are expected to be $249 million, including one-time technology costs of complying with the rule, a one-

time cost of installation downtime, annual operating and maintenance costs, and permitting costs (initial permit costs, annual monitoring costs, and permit reissuance costs).

These cost estimates include compliance costs for eight facilities that are projected to be base case closures.[51] Excluding compliance costs for projected base case closure facilities would result in annualized pre-tax facility compliance costs of approximately $376 million and annualized post-tax facility compliance costs of approximately $244 million. The equivalent annualized post-tax facility compliance costs were $178 million at proposal and $265 million for the NODA preferred option. The cost difference between proposal and the NODA is due primarily to the expanded range of technology options considered for the NODA and the "best performing technology" selection criteria used to assign cost modules to model facilities (see section IV of the NODA, 68 FR 13522, 13526).

In selecting technology modules for each model facility, EPA, to a degree departed from its traditional least cost approach. The least cost approach, traditionally utilized for estimating compliance technology choices relies on the principle that the complying plant will choose to install the least cost technology that meets the minimum standard. While the Agency is confident that the suite of available technologies can achieve compliance with the proposed performance

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[51] There are eight base case closures in 2008, the first model run year of the IPM. See section XI.B.1 for further discussion of analyses using the IPM.

requirements (60–90% reduction in entrainment and 80–95% reduction in impingement mortality relative to the calculation baseline), EPA lacks sufficient data and resources to determine the precise performance of each technology on a site-specific basis for over 400 different applications. The Agency thus selected, for subset of sites where multiple technologies could be under consideration to meet the requirements, a best performing technology (rather than the least costly technology of the choices). The best performing technology concept, when necessary to apply, relied on assigning technologies about a median cost, with some choices above and below. Therefore, for each model facility (or intake), in order to ensure that the technology on which costs were based would in fact achieve compliance at that model site, the Agency could not rely on a one-size fits all, least-cost approach. The cost difference between the NODA and the final rule is primarily a result of decreases in capital and permitting cost estimates.

Capital and O&M costs changed between NODA and final primarily due to three factors. The Agency revised its application of certain technology cost modules (especially the dual-entry, single-exist traveling screen module) between NODA and final, in response to comments received. The Agency revised its costs for some passive screen technology costs utilizing finer mesh screens, in response to comments received. In addition, the Agency credited facilities with far offshore intakes plus certain impingement controls in-place (such as fish handling or passive inlet screens) as having met the requirements for entrainment reduction at baseline. This final change was also in response to comments that recommended that the Agency correlate the

benefits assessment more closely with the engineering cost estimates. The overall net result of these changes was to slightly decrease total capital and total O&M costs of the rule. However, on the basis of facilities expected to upgrade technologies to meet the rule requirements, the capital and O&M costs did increase slightly.

There are many uncertainties surrounding any forecast. The national annualized costs estimated for today's rule were necessarily developed using several major assumptions which are subject to uncertainty. The Agency attempted to develop a plausible range of costs focusing on four major cost assumptions surrounding the direct private cost of $385 million that may be incurred when facilities implement this rule. Uncertainty factors were analyzed for the cost assumptions affecting technology capital, technology O&M, downtime for connection outages, initial permitting, and pilot studies. This *41651 uncertainty analysis provided a range of costs for the national private (direct) annualized compliance costs of $377 to $437 million. This range was developed by examining the effect of capacity utilization assumptions on technology capital and O&M costs; the effects of annualization time frame for initial permitting and downtime connection outages; the effects of sampling frequency and data analysis on pilot study costs; and excluding costs for facilities that have partial recirculating systems. For more information on the Agency's analysis of this issue, see DCN 6-5045.

Cost assumption	Base case facility compliance cost estimate	Sensitivity estimate
Annualization time frame for initial permitting and downtime	30 years	20 years
Partial recirculation system credit	No	Yes
Capacity utilization rate used to estimate technology capital and O&M	Based on 2008 IPM Forecast	Based on historic utilization
Pilot study costs	Moderate sampling frequency	High sampling frequency

B. Final Rule Impacts

1. Energy Market Model Analysis

At proposal and for the NODA, EPA used an electricity market model, the Integrated Planning Model (IPM®), to identify potential economic and operational impacts of various regulatory options considered for the Phase II regulation.[52] Electric reliability impact analyses could not be performed using the IPM model. EPA does recognize that due to down time or connection outages estimated to install several of the technologies, and the number of facilities that will need to come into compliance over the first few years after today's rule is promulgated, there may be short-term electric reliability issues unless care is taken within each region to coordinate outages with the North American Electric Reliability Council (NERC) and where possible with normal scheduled maintenance operations. Noting this, EPA has provided flexibility in today's rule so that facilities can develop workable construction schedules with their permit writers and coordinate with NERC to appropriately schedule down times (see § 125.95(b)(4)(ii)). As noted in the NERC 2003 Long-term Reliability Assessment, the overall impact on reliability of any new environmental requirements will "* * * depend on providing sufficient time to make the necessary modifications and the commercial availability of control

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[52] For a detailed description of the IPM see Chapter B3 of the Economic and Benefits Analysis (EBA) document in support of the proposed rule (DCN 4-0002; *http://www.epa.gov/ost/316b/econbenefits/b3.pdf*).

technologies."[53] EPA conducted impact analyses at the market level, by NERC region,[54] and for facilities subject to the Phase II regulation. Analyzed characteristics include changes in electricity prices, capacity, generation, revenue, cost of generation, and income. These changes were identified by comparing two scenarios: (1) The base case scenario (in the absence of any section 316(b) Phase I and Phase II regulation) and (2) the post compliance scenario (after the implementation of the new section 316(b) Phase II regulations). At proposal, EPA used the results of these comparisons to assess the impacts of the proposed rule and two of the five alternative compliance options considered by EPA: (1) The "Intake Capacity Commensurate with Closed-Cycle, Recirculating Cooling System based on Waterbody Type/Capacity" option and (2) the "Intake Capacity Commensurate with Closed-Cycle, Recirculating Cooling System for All Facilities" option. For the NODA, EPA assessed the impacts of the preferred

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[53] North American Electric Reliability Council (NERC). 2003. 2003 Long-term Reliability Assessment: The Reliability of Bulk Electric Systems in North America; prepared December 2003.

[54] The IPM models the ten NERC regions that cover the continental U.S.: ECAR (East Central Area Reliability Coordination Agreement), ERCOT (Electric Reliability Council of Texas), FRCC (Florida Reliability Coordinating Council), MAAC (Mid-Atlantic Area Council), MAIN (Mid-America Interconnected Network, Inc.), MAPP (Mid-Continent Area Power Pool), NPCC (Northeast Power Coordination Council), SERC (Southeastern Electricity Reliability Council), SPP (Southwest Power Pool), and WSCC (Western Systems Coordinating Council). Electric generators in Alaska and Hawaii are not interconnected with these regions and are not modeled by the IPM.

option and the "Intake Capacity Commensurate with Closed-Cycle, Recirculating Cooling System based on Waterbody Type/Capacity" option, making several changes to the analysis (major changes included changes in IPM model aggregation, capacity utilization assumptions, and treatment of installation downtime; see section V.A of the NODA).

Since publication of the NODA, EPA has conducted further IPM analyses. The following sections present a discussion of changes to the analysis since the NODA and the results of the re-analysis of the final rule.

a. Changes to the IPM analyses since the NODA. EPA did not change its IPM assumptions and modeling procedures for this final rule. EPA continued to use the 2000 version of the IPM model to perform the final rule analysis. In the 2003 current version of the IPM, the model has been updated to include, among other things, effects of the State Multi-Pollutant regulations and the New Source Review settlements on environmental compliance costs associated with the IPM base case. Further, the 2003 version of the IPM model includes updated costs for existing facilities such as life extension costs. However, a few general changes affect the results presented in the following subsection. These changes are outlined in section VI.A and include the following: An increase in the estimated number of in-scope Phase II facilities from 551 to 554; revisions of technology, operating and maintenance, and permitting/monitoring costs; and changes to the assumption of construction downtimes for compliance technologies other than recirculating cooling towers.

b. Revised results for the Final Rule. This section presents the revised impact analysis of the final rule. The impacts of compliance with the final rule are defined as the difference between the modeling results for the base case scenario and the modeling results for the post-compliance scenario. Two base case scenarios were used to analyze the impacts associated with the final rule. The first base case scenario was developed using EPA's electricity demand assumption. Under this assumption, demand for electricity is based on the Annual Energy Outlook (AEO) 2001 forecast adjusted to account for efficiency improvements not factored into AEO's projections of electricity sales. The second base case was developed using the unadjusted electricity demand from the AEO 2001. The results presented in this section use the first, EPA-adjusted base case. **[*41652]** Results using the second base case are presented in the Appendix of Chapter B3 of the final EBA.

EPA analyzed impacts of the final rule using data from model run year 2010. Model run year 2010 was chosen to represent the effects of the final rule for a typical year in which all facilities are expected to be in compliance (for this analysis, EPA assumed that facilities come into compliance between 2005 and 2009; in reality, compliance is expected to begin in 2008).[55] The analysis was conducted at two levels: the market level including all facilities (by NERC

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[55] EPA also analyzed potential market-level impacts of the final rule for a year during which some Phase II facilities experience installation downtimes. This analysis used output from model run year 2008. See Chapter B3, section B3-4.3 of the final EBA for the results of this analysis.

region) and the Phase II facility level (including analyses of the in-scope Phase II facilities as a group and of individual Phase II facilities). The results of these analyses are presented in the following subsections.

i. Market-level impacts of the Final Rule. The market-level analysis includes results for all generators located in each NERC region including facilities both in-scope and out-of-scope of the proposed Phase II rule. Exhibit XI-1 presents five measures used by EPA to assess market-level impacts associated with the final rule, by NERC region: (1) Incremental capacity closures, calculated as the difference between capacity closures under the final rule and capacity closures under the base case; (2) incremental capacity closures as a percentage of baseline capacity; (3) post-compliance changes in variable production costs per MWh, calculated as the sum of total fuel and variable O&M costs divided by total generation; (4) post-compliance changes in energy price, where energy prices are defined as the wholesale prices received by facilities for the sale of electric generation; and (5) post-compliance changes in pre-tax income, where pre-tax income is defined as total revenues minus the sum of fixed and variable O&M costs, fuel costs, and capital costs. Additional results are presented in Chapter B3: Electricity Market Model Analysis (section B3-4.1) of the Economic and Benefits Analysis (EBA) in support of the final rule (DCN 6-0002). Chapter B3 also presents a more detailed interpretation of the results of the market-level analysis.

EXHIBIT XI-1.—MARKET-LEVEL IMPACTS OF THE FINAL RULE (2010)

NERC Region	Baseline capacity (MW)	Incremental closures		Change in variable production cost per MWh (percent)	Change in energy price per MWh (percent)	Change in pre-tax income ($2002) (percent)
		Capacity (MW)	% of baseline capacity			
ECAR	118,529		–0.0	0.1	0.3	–0.8
ERCOT	75,290		–0.0	0.0	5.8	–5.6
FRCC	50,324		–0.0	0.4	0.6	–3.0
MAAC	63,784		–0.0	0.4	0.1	–0.9
MAIN	59,494	94	0.2	0.1	–0.3	–0.3
MAPP	35,835		–0.0	–0.1	–0.3	0.1
NPCC	72,477		–0.0	–0.5	–0.1	–1.9
SERC	194,485		–0.0	0.0	–0.1	–0.5
SPP	49,948		–0.0	–0.1	–0.2	–0.4
WSCC	167,748	58	0.0	0.0	0.0	–0.5
Total	887,915	152	0.0	0.0	n/a	–1.0

Two of the ten NERC regions modeled, MAIN and WSCC, are estimated to experience economic closures of existing capacity as a result of the final rule. These closures represent negligible percentages of regional baseline capacity (0.2% in MAIN and less than 0.1% in WSCC) and of total U.S. baseline capacity (less than 0.1%). EPA estimates that four NERC regions will experience increases in variable production costs per MWh, although the largest increase will not exceed 0.4 percent. In addition, four NERC regions will experience an increase in energy prices under the final rule. Of these, only ERCOT is estimated to experience an increase of more than 1.0 percent (5.8 percent). Pre-tax incomes are estimated to decrease in all but one region, but the majority of these changes will be less than 1.0 percent. ERCOT is estimated to experience the largest decrease in pre-tax income (–5.6 percent). Only one region, MAPP, will experience an increase in market-level pre-tax income (0.1 percent).

ii. Facility-level impacts of the Final Rule. The results from model run year 2010 were used to analyze impacts on Phase II facilities at two levels: (a) Potential changes in the economic and operational characteristics of the group of in-scope Phase II facilities as a whole and (b) potential changes to individual facilities within the group of Phase II facilities. Exhibit XI-2 presents five measures used by EPA to assess impacts to the group of Phase II facilities associated with the final rule, by NERC region: (1) Incremental capacity closures, calculated as the difference between capacity closures under the final rule and capacity closures under the base case; (2) incremental capacity closures as a percentage of baseline

capacity; (3) post-compliance changes in variable production costs per MWh, calculated as the sum of total fuel and variable O&M costs divided by total generation; (4) post-compliance changes in electricity generation; and (5) post-compliance changes in pre-tax income, where pre-tax income is defined as total revenues minus the sum of fixed and variable O&M costs, fuel costs, and capital costs. Additional results are presented in section B3-4.2 of the final EBA. Chapter B3 also presents a more detailed interpretation of the results of the analysis of Phase II facilities as a group. **[*41653]**

EXHIBIT XI-2.—IMPACTS ON PHASE II FACILITIES OF THE FINAL RULE (2010)

NERC Region	Baseline capacity (MW)	Incremental closures		Change in variable production cost per MWh (percent)	Change in energy price per MWh (percent)	Change in pre-tax income ($2002) (percent)
		Capacity (MW)	% of baseline capacity			
ECAR	82,313		0.0	0.0	–0.2	–1.0
ERCOT	43,522		0.0	–0.7	–1.8	–10.4
FRCC	27,537		0.0	0.3	–0.8	–4.0
MAAC	34,376		0.0	0.0	0.2	–1.4
MAIN	36,498	94	0.3	0.1	–0.3	–0.6
MAPP	15,749		0.0	–0.1	0.0	0.3
NPCC	37,651		0.0	–1.7	–3.6	–4.3
SERC	107,450		0.0	0.3	–0.2	–0.7
SPP	20,471		0.0	–0.4	–0.7	–1.0
WSCC	28,431	58	0.2	–0.9	–4.3	–10.4
Total	433,998	152	0.0	–0.6	–0.8	–1.8

Identical to the market-level results, EPA estimates that 152 MW, or less than 0.1%, of capacity at Phase II facilities will close as a result of the final rule. (If the AEO's higher demand forecast is utilized, it would result in a larger capacity of early closures of 493 MW or more than 0.1%. See EBA B3 appendix Table B3-A-3.) MAIN (94 MW) and WSCC (58 MW) are the only regions that are estimated to experience incremental capacity closures. In both regions, these incremental closures represent less than 0.3% of baseline capacity at Phase II facilities. Variable production costs per MWh at Phase II facilities increase in two regions and decrease in six regions under the final rule. No region experiences an increase in Phase II facility production costs that exceeds 0.5 percent, while Phase II facilities in NPCC and WSCC see reductions of 1.7 percent and 0.9 percent, respectively. Phase II facilities in three NERC regions are estimated to experience decreases in generation in excess of 1.0 percent as a result of the final rule. The largest is estimated to be in WSCC, where Phase II facilities experience a 4.3 percent reduction in generation. Overall, EPA estimates that pre-tax income will decrease by 1.8 percent for the group of Phase II facilities. The effects of this change are concentrated in a few regions: WSCC and ERCOT each experience reductions in pre-tax income of 10.4 percent, which is driven by a reduction in revenues (not presented in this exhibit) rather than an increase in costs. NPCC and FRCC are estimated to experience a reduction of 4.3 and 4.0 percent, respectively.

Results for the group of Phase II facilities as a whole may mask shifts in economic performance

among individual facilities subject to this rule. To assess potential distributional effects, EPA analyzed facility-specific changes between the base case and the post-compliance case in (1) capacity utilization, defined as generation divided by capacity times 8,760 hours, (2) electricity generation, (3) revenue, (4) variable production costs per MWh, defined as variable O&M cost plus fuel cost divided by generation, and (5) pre-tax income, defined as total revenues minus the sum of fixed and variable O&M costs, fuel costs, and capital costs.

Exhibit XI-3 presents the total number of Phase II facilities with estimated degrees of change due to the final rule. This exhibit excludes 17 in-scope facilities with estimated significant status changes in 2010: Ten facilities are base case closures, one facility is a full closure as a result of the final rule, and six facilities changed their repowering decision between the base case and the post-compliance case. These facilities are either not operating at all in either the base case or the post-compliance case, or they experience fundamental changes in the type of units they operate; therefore, the measures presented in Exhibit XI-3 would not be meaningful for these facilities. In addition, the change in variable production cost per MWh of generation could not be developed for 57 facilities with zero generation in either the base case or post-compliance scenario. For these facilities, the change in variable production cost per MWh is indicated as "n/a."

EXHIBIT XI-3.—OPERATIONAL CHANGES AT PHASE II FACILITIES FROM THE FINAL RULE (2010)[a]

Economic measures	Reduction			Increase			No change	N/A
	≤1%	1–3%	>3%	≤1%	1–3%	>3%		
Change in Capacity Utilization[b]	6	21	25	7	7	11	441	0
Change in Generation	4	6	46	11	5	18	428	0
Change in Revenue	83	30	45	142	8	16	194	0
Change in Variable Production Costs/MWh	38	16	9	145	11	17	225	57
Change in Pre-Tax Income	115	109	213	44	11	15	11	0

[a] For all measures percentages used to assign facilities to impact categories have been rounded to the nearest 10th of a percent.

[b] The change in capacity utilization is the difference between the capacity utilization percentages in the base case and post-compliance case. For all other measures, the change is expressed as the percentage change between the base case and post-compliance values.

EPA estimates that the majority of Phase II facilities will not experience changes in capacity utilization or generation due to compliance with the final rule. Of those facilities with changes in post-compliance capacity utilization and generation, most will experience decreases in these measures. Exhibit XI-3 also indicates that the majority of facilities with changes in variable production costs will experience increases. However, about 85 **[*41654]** percent of those increases are estimated to be 1.0 percent or less. Changes in revenues at a majority of Phase II facilities will also not exceed 1.0 percent. The largest effect of the final rule is estimated to be on facilities' pre-tax income: the model projects that over 80 percent of facilities will experience a reduction in pre-tax income, with about 40 percent of the overall total experiencing a reduction of 3.0 percent or greater.

2. Other Economic Analyses

EPA updated its other economic analyses conducted at proposal and for the NODA to determine the effect of changes made to the assumptions for the final rule on steam electric generating facilities. This section discusses changes made to EPA's methodology and assumptions and presents the updated results. For complete results of this analysis, refer to Chapter B2 of the final EBA. For complete results of the proposal and the NODA analyses, refer to the chapters in Part B of the EBA document in support of the proposed rule at *http://www.epa.gov/waterscience/316b/econbenefits/* and DCN 5-3004 of the NODA docket.

It should be noted that the measures presented in this section are provided in addition to the economic

impact measures based on the Integrated Planning Model (IPM®) analyses (see section XI.B.1). The following measures are used to assess the magnitude of compliance costs; they are not used to predict closures or other types of economic impacts on facilities subject to Phase II regulation.

a. Cost-to-revenue measure.

i. Facility-level analysis. EPA examined the annualized post-tax compliance costs of the final rule as a percentage of baseline annual revenues, for each of the 554 facilities expected to be subject to Phase II of the regulation. This measure allows for a comparison of compliance costs incurred by each facility with its revenues in the absence of the Phase II regulation. The revenue estimates are facility-specific baseline projections from the IPM base case for 2008 (see section XI.B.1 for a discussion of EPA's analyses using the IPM).[56]

Similar to the findings at proposal and for the NODA preferred option, EPA estimates that a majority of the facilities subject to the final rule, 413 out of 554 (75 percent), will incur annualized costs of less than one percent of revenues. Of these, 314 facilities incur compliance costs of less than 0.5 percent of revenues. In addition, 94 facilities (17 percent) are estimated to incur costs of between one

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[56] EPA used 2008 rather than 2010 baseline revenues for this analysis because 2008 is the first model run year specified in the IPM analyses. EPA used the first model run year because it more closely resembles the current operating conditions of in-scope facilities than later run years (over time, facilities may be increasingly affected by factors other than the Phase II regulation).

and three percent of revenues, and 39 facilities (7 percent) are estimated to incur costs of greater than three percent. Eight facilities are estimated to be base case closures.

ii. Firm-level analysis. The firms owning the facilities subject to Phase II regulation may experience greater impacts than individual in-scope facilities if they own more than one facility with compliance costs. EPA therefore also analyzed the cost-to-revenue ratios at the firm level. EPA identified the domestic parent entity of each in-scope facility and obtained their sales revenue from publicly available data sources (the Dun and Bradstreet database for parent firms of investor-owned utilities and nonutilities; and Form EIA-861 for all other parent entities). This analysis showed that 126 unique domestic parent entities own the facilities subject to Phase II regulation. EPA compared the aggregated annualized post-tax compliance costs for each facility owned by the 126 parent entities to the firms' total sales revenue.

Since proposal, EPA has updated the parent firm determination for Phase II facilities. EPA also updated the average Form EIA-861 data used for this analysis from 1996–1998 (used at proposal) to 1997–1999 (used for the NODA) and 1999–2001 (used for the final rule). In addition, EPA made one modification to the sources of revenue data used in this analysis: At proposal, EPA used sales volume from Dun and Bradstreet (D&B) for any parent entity listed in the database. If D&B data were not available, EPA used the EIA database or the survey. For the NODA and final rule analyses, EPA used the D&B database for privately-owned entities only. For

other entities, EPA used the EIA database. For the final rule analysis, EPA conducted additional research (*e.g.*, Securities and Exchange Commission 10-K filings; company web sites) to collect revenue data for those firms whose revenue was not reported in either D&B or Form EIA 861.

For the final rule, EPA estimates that of the 126 parent entities, 115 entities (91 percent) will incur annualized costs of less than one percent of revenues. Of these, 105 entities incur compliance costs of less than 0.5 percent of revenues. In addition, 10 entities (8 percent) are estimated to incur costs of between one and three percent of revenues, and only one entity (1 percent) is estimated to incur costs of greater than three percent. The highest estimated cost-to-revenue ratio for the final rule is 6.7 percent of the entities' annual sales revenue (for the proposed rule, this value was 5.3 percent; for the NODA preferred option, this value was 7.4 percent).

b. Cost per household. EPA also conducted an analysis that evaluates the potential cost per household, if Phase II facilities were able to pass compliance costs on to their customers. This analysis estimates the average compliance cost per household for each North American Electricity Reliability Council (NERC) region,[57] using two data

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[57] There are twelve NERC regions: ASCC (Alaska Systems Coordinating Council), ECAR (East Central Area Reliability Coordination Agreement), ERCOT (Electric Reliability Council of Texas), FRCC (Florida Reliability Coordinating Council), HI (Hawaii), MAAC (Mid-Atlantic Area Council), MAIN (Mid-America Interconnected Network, Inc.), MAPP (Mid-Continent Area Power Pool), NPCC (Northeast Power Coordination Council), SERC (Southeastern Electricity Reliability Council),

inputs: (1) The average annual pre-tax compliance cost per megawatt hour (MWh) of total electricity sales and (2) the average annual MWh of residential electricity sales per household. For the proposal and NODA analyses, EPA used 2000 electricity sales information from Form EIA-861 (Annual Electric Power Industry Report); for the final rule, EPA updated the electricity sales information to 2001.

The results of this analysis show that the average annual cost of the final rule per residential household is expected to range from $0.50 in Alaska to $8.18 in Hawaii. The U.S. average is estimated to be $1.21 per household.

c. Electricity price analysis. EPA also considered potential effects of the final Phase II rule on electricity prices. EPA used three data inputs in this analysis: (1) Total pre-tax compliance cost incurred by facilities subject to Phase II regulation, (2) total electricity sales, based on the Annual Energy Outlook (AEO), and (3) prices by end use sector (residential, commercial, industrial, and transportation), also from the AEO. All three data elements were calculated by NERC region. For the proposal and NODA analyses, EPA used the AEO 2002; for the final rule, EPA updated the data with the AEO 2003.

The results of the final rule analysis show that the annualized costs of complying (in cents per KWh sales) range from 0.007 cents in the SPP region to 0.019 cents in the NPCC region. To determine

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SPP (Southwest Power Pool), and WSCC (Western Systems Coordinating Council).

potential effects of these **[*41655]** compliance costs on electricity prices, EPA compared the per KWh compliance cost to baseline electricity prices by end use sector and for the average of the sectors (the detailed results are presented in Chapter B2 of the final EBA). This analysis projects that the greatest increase in electricity prices will be in the WSCC region (0.3 percent). The average increase in electricity prices is estimated to be 0.16 percent (for the proposed rule, this value was 0.11 percent; for the NODA preferred option, this value was 0.17 percent).

XII. Benefits Analysis

A. Introduction

This section presents EPA's estimates of the national environmental benefits of the final section 316(b) regulations for Phase II existing facilities. The assessed benefits occur due to the reduction in impingement and entrainment at cooling water intake structures affected by this rulemaking. Impingement and entrainment kills or injures large numbers of all life stages of aquatic organisms. By reducing the levels of impingement and entrainment, today's final rule will increase the number of fish, shellfish, and other aquatic life in local aquatic ecosystems. This, in turn, directly and indirectly improves use benefits such as those associated with recreational and commercial fisheries. Other types of benefits, including ecological and non-use values, would also be enhanced. Section D provides an overview of the types and sources of benefits anticipated, how these benefits are estimated, the level of benefits achieved by the final rule, and how monetized benefits compare to costs. The analysis

was based on impingement and entrainment data from facility studies. Most of these studies counted losses of fish species only and considered only a limited subset of the species impinged and entrained.

To estimate the economic benefits of reducing impingement and entrainment at existing cooling water intake structures, all the beneficial outcomes need to be identified and, where possible, quantified and assigned appropriate monetary values. Estimating economic benefits is challenging because of the many steps necessary to link reductions in impingement and entrainment to changes in impacted fisheries and other aspects of relevant aquatic ecosystems, and then to link these ecosystem changes to the resulting changes in quantities and values for the associated environmental goods and services that ultimately are linked to human welfare. The methodologies used in the estimation of benefits of the final rule are largely built upon those used for estimating use benefits of the proposed rule (see 67 FR 17121) and the Notice of Data Availability (see 67 FR 38752). The Regional Analysis Document for the Proposed Phase II Existing Facilities Rule (see DCN 6-0003), hereafter known as the Regional Study or Regional Analysis, provides EPA's complete benefit assessment for the final rule.

National benefit estimates for this rule are derived from a series of regional studies across the country from a range of waterbody types. Section XII.B provides detail on the regional study design. Sections XII.C through XII.E of this preamble describe the methods EPA used to evaluate impingement and entrainment impacts at Phase II existing facilities and to derive an economic value

associated with any such losses. Regional benefits are estimated using a set of statistical weights for each in-scope facility that were developed as part of the survey design. National benefit estimates are obtained by summing regional benefits.

B. Regional Study Design

In its analysis for the section 316(b) Phase II proposal, EPA relied on case studies of 19 facilities grouped by waterbody type (oceans, estuaries/tidal rivers, lakes/reservoirs, and rivers/streams) to estimate the potential economic benefits of reduced impingement and entrainment. For the proposal analysis, EPA extrapolated estimates of impingement and entrainment for each of the case study facilities to other facilities located on the same waterbody type, including those in different regions. However, a number of commenters expressed concern about this method of extrapolation, noting that there are important ecological and socioeconomic differences among different regions of the country, even within the same waterbody type. To address this concern, EPA revised the design of its analysis to examine cooling water intake structure impacts and regulatory benefits at the regional level. This involved the evaluation of impingement and entrainment data collected by the industry for another 27 facilities in addition to the 19 facilities evaluated for proposal (for a total of 46 facilities). Regional results were then combined to develop national estimates.

The Agency evaluated the benefits of today's rule in seven study regions (North Atlantic, Mid Atlantic, South Atlantic, Gulf of Mexico, California, Great Lakes, and Inland) based on similarities in the

affected ecosystems, aquatic species present, and characteristics of commercial and recreational fishing activities within each of the seven regions (see the background chapter of each study region in Parts B–H of the Regional Analysis Document for maps of the study regions). The five coastal regions (California, North Atlantic, Mid-Atlantic, South Atlantic, and Gulf of Mexico) correspond to those of the National Oceanographic and Atmospheric Association (NOAA) Fisheries. The Great Lakes region includes all facilities in scope of the Phase II rule that withdraw water from Lakes Ontario, Erie, Michigan, Huron, and Superior or are located on a waterway with open fish passage to a Great Lake and within 30 miles of the lake. The Inland region includes the remaining facilities that withdraw water from freshwater lakes, rivers, and reservoirs.

Based on comments on the proposal about study gaps, EPA used available life history data to construct representative regional life histories for groups of similar species with a common life history type and groups used by NOAA Fisheries for landings data. Aggregation of species into groups facilitated evaluation of facility impingement and entrainment monitoring data. DCN 6-0003 provides a listing of the species in each life history group evaluated by EPA and tables of the life history data and data sources used for each group.

To obtain regional impingement and entrainment estimates, EPA extrapolated losses from selected facilities with impingement and entrainment data to all other facilities within the same region. Impingement and entrainment data were extrapolated on the basis of operational flow, in

millions of gallons per day (MGD), where MGD is the average operational flow over the period 1996–1998 as reported by facilities in response to EPA's Section 316(b) Detailed Questionnaire and Short Technical Questionnaire. Operational flow at each facility was scaled using factors reflecting the relative effectiveness of currently in-place technologies for reducing impingement and entrainment. DCN 6-0003 provides details of the extrapolation procedure. The goal of the analysis was to provide regional and national estimates, so although there may be variability in the actual losses (and benefits) per MGD across particular individual facilities, EPA believes that this method of extrapolation is a reasonable basis for developing an estimate of regional- and national-level **[*41656]** benefits for the purposes of this rulemaking.

C. The Physical Impacts of Impingement and Entrainment

EPA's benefits analysis is based on facility-provided biological monitoring data. Facility data consist of records of impinged and entrained organisms sampled at intake structures. However, factors such as sampling methods and equipment, the number of samples taken, the duration of the sampling period, and the unit of time and volume of intake flow used to express impingement and entrainment, and other aspects of facility sampling programs, are highly variable. The data available covered organisms of all ages and life stages from newly laid eggs to mature adults. Therefore, EPA converted sampling counts into standardized estimates of the annual numbers of fish impinged or entrained and then expressed these estimates in

terms of metrics suitable for the environmental assessment and economic benefits analysis.

EPA notes that the facility studies evaluated may under or over estimate impingement and entrainment rates. For example, facility studies typically focus on only a subset of the fish species impacted by impingement and entrainment, resulting in an underestimate of the number of species and total losses. Studies often did not count early life stages of organisms that were hard to identify. In addition, most studies EPA found were conducted over 30 years ago, before activities under the Clean Water Act improved aquatic conditions. In those locations where water quality was degraded relative to current conditions, the numbers and diversity of fish may have been depressed during the monitoring period, resulting in low impingement and entrainment estimates. On the other hand, use of linear methods for projecting losses to fish and shellfish in the waterbody may overstate or understate impacts. Nevertheless, EPA believes that the data from the facility studies were sufficient for developing an estimate of the relative magnitude of impingement and entrainment losses nation-wide.

Using standard fishery modeling techniques,[58] EPA constructed models that combined facility-

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[58] Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada, Bulletin 191; Hilborn, R. and C.J. Walters. 1992. Quantitative Fisheries Stock Assessment, Choice, Dynamics and Uncertainty. Chapman and Hall, London and New York.; Quinn, T.J., II. and R.B. Deriso. 1999. Quantitative Fish Dynamics. Oxford University Press, Oxford and New York; Dixon, D.A. 1999. Catalog of Assessment

derived impingement and entrainment counts with relevant life history data to derive estimates of (1) age-one equivalent losses (the number of individuals of different ages impinged and entrained by facility intakes expressed as age-one equivalents), (2) foregone fishery yield (pounds of commercial harvest and numbers of recreational fish and shellfish that are not harvested due to impingement and entrainment), and (3) foregone biomass production (pounds of impinged and entrained forage species that are not commercial or recreational fishery targets but serve as valuable components of aquatic food webs, particularly as an important food supply to other aquatic species, including commercial and recreational species). Estimates of foregone fishery yield include direct and indirect losses of impinged and entrained species that are harvested. Indirect losses represent the yield of these harvested species that is lost due to losses of forage species. Details of the methods used for these analyses are provided in Chapter A5 of Part A of the Regional Analysis document. For all analyses, EPA used the impingement and entrainment estimates provided by the facility and assumed 100% entrainment mortality based on the analysis of entrainment survival studies presented in Chapter A7 of Part A of the Regional Analysis document.

Exhibit XII-1 presents EPA's estimates of the current level of total annual impingement and entrainment in the study regions.

Methods for Evaluating the Effects of Power Plant Operations on Aquatic Communities. Final Report. Report number TR-112013.

EXHIBIT XII-1.—TOTAL CURRENT ANNUAL IMPINGEMENT AND ENTRAINMENT, BY REGION

Region	Age-one equivalents (millions)	Foregone fishery yield (million lbs)	Biomass production foregone (million lbs)
California	312.94	28.87	43.62
North Atlantic	65.70	1.26	289.12
Mid Atlantic	1,733.14	67.2	110.90
South Atlantic	342.54	18.34	28.31
Gulf of Mexico	191.23	35.81	48.12
Great Lakes	319.11	3.59	19.34
Inland	369	3.53	122.0
Total for 554 Facilities[a]	3,449.38	164.97	717.07

[a] National totals are sample-weighted and include Hawaii. Hawaii benefits are calculated based on average loss per MGD in North Atlantic, Mid Atlantic, Gulf of Mexico, California and the total intake flow in Hawaii.

Exhibit XII-2 presents EPA's estimates of annual combined impingement and entrainment reductions associated with the rule, by region. **[*41657]**

EXHIBIT XII-2.—REDUCTIONS IN ANNUAL IMPINGEMENT AND ENTRAINMENT, BY REGION

Region	Age-one equivalents (millions)	Foregone fishery yield (million lbs)	Biomass production foregone (million lbs)
California	66.39	6.10	9.19
North Atlantic	19.34	0.37	84.28
Mid Atlantic	846.37	34.28	54.66
South Atlantic	76.67	5.31	6.31
Gulf of Mexico	89.55	13.84	16.50
Great Lakes	159.52	1.73	8.51
Inland	116.83	1.06	20.90
Total for 554 Facilities[a]	1420.20	64.92	217.09

[a] National totals are sample-weighted and include Hawaii. Hawaii losses are calculated based on average loss per MGD at mainland coastal facilities and the total intake flow of the Hawaii facilities.

D. National Benefits of Rule

1. Overview

Economic benefits of today's rule can be broadly defined according to categories of goods and services provided by the species affected by impingement and entrainment at cooling water intake structures (CWIS). The first category includes benefits that pertain to the use (direct or indirect) of the affected fishery resources. The direct use benefits can be further categorized according to whether or not affected goods and services are traded in the market. The "direct use" benefits of the 316(b) regulation include both "market" commodities (*e.g.*, commercial fisheries) and "nonmarket" goods (*e.g.*, recreational angling). Indirect use benefits also can be linked to either market or nonmarket goods and services—for example, the manner in which reduced impingement- and entrainment-related losses of forage species leads through the aquatic ecosystem food web to enhance the biomass of species targeted for commercial (market) and recreational (nonmarket) uses. The second category includes benefits that are independent of any current or anticipated use of the resource; these are known as "non-use" or "passive use" values. Non-use benefits reflect human values associated with existence and bequest motives.

The economic value of benefits is estimated using a range of valuation methods, with the specific approach being dependent on the type of benefit category, data availability, and other suitable factors. Commercial fishery benefits are valued using market data. Recreational angling benefits are valued using a combination of primary and

secondary research methods. For four of the seven study regions, EPA developed original Random Utility Models (RUM) of recreational angling behavior to estimate changes in recreational fishing values resulting from improved fishing opportunities due to reductions in impingement and entrainment. For the remaining three study regions (Inland, North Atlantic, and South Atlantic), EPA used secondary nonmarket valuation data (*e.g.*, benefits transfer of nonmarket valuation studies of the value of recreational angling). Because methodologies for estimating use values for recreational and commercial species are well developed, and some of these species have been extensively studied, these values are relatively straightforward to estimate. Sections XII.D.3 and XII.D.4 briefly summarize EPA's approaches to measuring direct use benefits. A detailed description of these approaches can be found in the 316(b) Regional Analysis document.

Estimating benefits from reduced impingement and entrainment of forage species is more challenging because these species are not targeted directly by commercial or recreational anglers and have no direct use values that can be observed in markets or inferred from revealed actions of anglers. To estimate indirect use benefits from reducing impingement and entrainment losses to forage species, EPA used a simple trophic transfer model that translates changes in impingement and entrainment losses of forage fish into changes in the harvest of commercial and recreational species that are subject to impingement and entrainment (*i.e.*, not the whole food web). Agency benefits estimates are based on projected numbers of age 1 equivalent fish saved under the final rule.

Neither forage species nor the unlanded portion of recreational and commercial species have direct uses; therefore, they do not have direct use values. Their potential value to the public is derived from two alternative sources: their indirect use as both food and breeding population for those fish harvested; and, the willingness of individuals to pay for the protection of fish based on a sense of altruism, stewardship, bequest, or vicarious consumption (non-use benefits). To estimate non-use benefits from reducing losses to forage species, and landed and unlanded commercial and recreational species, EPA explored benefits transfer from nonmarket valuation studies of non-use values of aquatic ecosystem improvements. EPA also explored the transfer of secondary nonmarket valuation data to value losses of threatened and endangered species. These efforts generated evidence that non-use values could occur as a result of this rule, but EPA was unable, by the time of publication of this final rule, to estimate reliable valuations for the resource changes associated with the expected results of this rule. EPA also investigated additional approaches to illustrate public willingness-to-pay for potential aquatic resource improvements that might occur because of this rule, but the Agency did not have sufficient time to fully develop and analyze these non-use benefit approaches for the final rule. Section XII.D.5 briefly summarizes the approaches EPA considered for measuring non-use benefits. Additional details about all approaches explored for estimating benefits can be found in Section XII.F and the 316(b) Regional Analysis document (DCN 6-0003).

As a consequence of the challenges associated with estimating benefits, some benefits are described only qualitatively, because it was not feasible, by the time of publication of this final rule, to derive reliable quantitative estimates of the degree of impact and/or the monetary value of reducing those impacts at the national level.

The remaining parts of Section XII.D below discuss details about discounting future benefits, valuation of recreational fishing, valuation of commercial fishing, **[*41658]** potential non-use benefits, and estimation of national benefits.

2. Timing of Benefits

Discounting refers to the economic conversion of future benefits and costs to their present values, accounting for the fact that individuals tend to value future outcomes less than comparable near-term outcomes. Discounting is important when benefits and costs occur in different years, and enables a comparison of benefits to costs across different time periods.

For today's rule, benefits are discounted to calculate benefits in a manner that makes the timing comparable to the annualized cost estimates. The benefits of today's rule are estimated as the typical benefits expected once the rule takes effect. The need to discount arises from two different delays in the realization of benefits.

First, facilities will not immediately achieve compliance. Facilities will face regulatory requirements once the rule takes effect, but it will take time to make the required changes. EPA has assumed, for the purpose of estimating benefits, that it will

take one year from the date when installation costs are incurred by a facility until the required cooling water technology is operational. To account for this lag, all benefits are discounted by one year from the date when costs are incurred.

Second, an additional time lag will result between the time of technology implementation and resulting increased fishery yields. This lag stems from the fact that one or more years may pass between the time an organism is spared impingement and entrainment and the time of its ultimate harvest. For example, a larval fish spared from entrainment (in effect, at age 0) may be caught by a recreational angler at age 3, meaning that a 3-year time lag arises between the incurred technology cost and the realization of the estimated recreational benefit. Likewise, if a 1-year old fish is spared from impingement and is then harvested by a commercial waterman at age 2, there is a 1-year lag between the incurred cost and the subsequent commercial fishery benefit. To account for this growth period, EPA applied discounting by species groups in each regional study. EPA conducted this analysis using two alternative discount rates as recommended by OMB: 3% and 7%. The Agency notes that discounting was applied to recreational and commercial fishing benefits only. Non-use benefits are independent of fish age and size and, thus start as soon as impingement and entrainment ceases.

3. Recreational Fishing Valuation

a. Recreational fishery methods for marine regions. For the five coastal regions, EPA's analysis of recreational fishing benefits from reduced impingement and entrainment is based on region-

specific random utility models (RUM) of recreational anglers' behavior, combined with benefit function transfer. EPA developed original RUM models for four of the five coastal regions: California, the Mid-Atlantic, the South Atlantic, and the Gulf of Mexico. For the North Atlantic region, EPA used a model developed by the National Marine Fisheries Service (NMFS) by Hicks et al. (Hicks, Steinback, Gautam, and Thunberg, 1999. Volume II: The Economic Value of New England and Mid-Atlantic Sportfishing in 1994—DCN 5-1271). Chapter A11 of the Regional Analysis document provides detailed discussion of the methodology used in EPA's RUM analysis.

The regional recreational fishing studies use information on recreational anglers' behavior to infer anglers' economic value for the quality of fishing in the case study areas. The models' main assumption is that anglers will get greater satisfaction, and thus greater economic value, from sites where the catch rate is higher due to reduced impingement and entrainment, all else being equal. This benefit may occur in two ways: first, an angler may get greater enjoyment from a given fishing trip when catch rates are higher, and thus get a greater value per trip; second, anglers may take more fishing trips when catch rates are higher, resulting in greater overall value for fishing in the region. EPA modeled an angler's decision to visit a site as a function of site-specific cost, fishing trip quality, and additional site attributes such as presence of boat launching facilities or fish stocking at the site.

The Agency used 5-year historical catch rates per hour of fishing as a measure of baseline fishing quality in the regional studies. Catch rate is one of

the most important attributes of a fishing site from the angler's perspective. This attribute is also a policy variable of concern because catch rate is a function of fish abundance, which is affected by fish mortality caused by impingement and entrainment.

The Agency used the estimated model coefficients in conjunction with the estimated changes in impingement and entrainment in a given region to estimate per-day welfare gain to recreational anglers due to the final rule. For the North Atlantic region, EPA used model coefficients estimated by Hicks et al. (1999) (DCN 4-1603).

To estimate the total economic value to recreational anglers for changes in catch rates resulting from changes in impingement and entrainment in a given region, EPA multiplied the total number of fishing days for a given region by the estimated per-day welfare gain due to the regulation. Because of data limitations, EPA was unable to estimate participation models for all regions. For the California and Great Lakes regions, the welfare estimates presented in the following section are based on the estimates of baseline recreational fishing participation provided by NOAA Fisheries. Thus, welfare estimates for these two regions presented in today's rule do not account for changes in recreational fishing participation due to the improved quality of the fishing sites; however, these changes are likely to be small based on results for other regions.

For the North Atlantic, Mid-Atlantic, South-Atlantic, and Gulf regions, estimates are based on an average of baseline and predicted increased fishing days. For these regions, EPA also estimated a trip

frequency model, which captures the effect of changes in catch rates on the number of fishing trips taken per recreational season.

b. Recreational Fishery methods for the Great Lakes region. For the Great Lakes region, EPA developed an original RUM model for the state of Michigan, and transferred benefits to other Great Lakes states. EPA's RUM model for the Great Lakes used data from the 2001 Michigan Recreational Anglers survey, and information on historical catch rates at Michigan fishing sites on Lakes Michigan, Huron, Superior, and Erie provided by the Michigan Department of Natural Resources (MDNR, 2002, DCN 4-1863). For the Great Lakes, EPA estimated a single RUM site choice model for boat, shore, and ice-fishing modes. To transfer values from the Michigan study to other Great Lakes states, EPA used harvest information from state-level anglers' creel surveys, and participation information from the U.S. Fish and Wildlife Service's Annual Survey of Fishing, Hunting, and Wildlife-Related Recreation (U.S. Department of the Interior, 2001, DCN 1-3082-BE).

c. Recreational fishery methods for the Inland region. For the Inland region, EPA used a benefit transfer approach to value post regulation recreational impingement and entrainment losses. EPA conducted this analysis for five aggregate species groups: panfish, perch, walleye/pike, bass, and anadromous gamefish. The panfish group includes **[*41659]** species commonly classified as panfish, except perch, and includes species that did not clearly fit in one of the other groups. Using estimates collected from ten studies, the Agency calculated measures of central tendency for the

marginal value of catching one additional fish for each species group. For detail see Chapter H4, of the Regional Study Document, DCN 6-0003.

The mean marginal value per additional fish caught is $2.55 for panfish, $0.38 for perch, $6.54 for walleye/pike, $4.18 for bass, and $11.95 for anadromous gamefish. EPA combined these marginal values per fish with estimates of recreational fishing losses that would be prevented by the regulation to calculate the value of post regulation recreational fishing benefits.

d. Results. As noted earlier in this section, anglers will get greater satisfaction, and thus greater economic value, from sites where the catch rate is higher, all else being equal. Decreasing impingement and entrainment increases the number of fish available to be caught by recreational anglers, thus increasing angler welfare.

Exhibit XII-3 shows the benefits that would result from reducing impingement and entrainment losses by installing cooling water intake technology under the final regulation. These values were discounted at a 3 percent discount rate and a 7 percent discount rate to reflect the fact that fish must grow to a certain size before they will be caught by recreational anglers and to account for the one-year lag between the date when installation costs are incurred and technology implementation.

The greatest recreational fishing benefits from reducing impingement and entrainment losses occur in the Mid-Atlantic, South Atlantic, and Great Lakes regions. For more detailed information on the models and results for each region, see Chapter 4 in

Parts B through H of the 316(b) Regional Analysis document.

EXHIBIT XII-3.—POST REGULATION RECREATIONAL FISHING BENEFITS FROM REDUCING ENTRAINMENT LOSSES

Region	Baseline recreational fishery losses (number of fish)	Reduction in recreational fishery losses (number of fish)	Benefits of final rule (million 2002$)		
			0% Discount Rate	3% Discount Rate	7% Discount Rate
California	5,787,661	1,735,668	$3.01	$2.45	$1.94
North Atlantic	916,396	267,536	1.59	1.38	1.17
Mid Atlantic	20,468,540	9,990,333	47.69	43.37	38.48
South Atlantic	4,314,983	985,769	7.49	6.85	6.17
Gulf of Mexico	3,854,850	1,201,806	6.79	6.18	5.53
Great Lakes	4,743,384	2,283,896	15.51	13.95	12.21
Inland	3,188,097	930,610	3.34	2.98	2.58
Total for 554 Facilities[a]	44,513,814	17,908,496	87.83	79.34	69.96

[a] National totals are sample-weighted and include Hawaii. Hawaii benefits are calculated based on average loss per MGD in North Atlantic, Mid Atlantic, Gulf of Mexico, California and the total intake flow in Hawaii.

The total for all regions, discounted at three percent, is $79.3 million; and the total for all regions, discounted at seven percent, is $70.0 million.

e. Limitations and uncertainties. Because of the uncertainties and assumptions of EPA's analysis, the estimates of benefits presented in this section may understate the benefits to recreational anglers. In estimating the benefits of improved recreational angling for the California and Great Lakes regions, the Agency assigned a monetary benefit only to the increases in consumer surplus for the baseline number of fishing days. This approach omits the portion of recreational fishing benefits that arise when improved conditions lead to higher levels of participation. However, EPA's analysis of changes in recreational fishing participation due to the regulation for other coastal regions shows that the practical effect of this omission is likely to be very small with respect to the total recreational benefits assessment.

4. Commercial Fishing Valuation

Reductions in impingement and entrainment at cooling water intake structures are expected to benefit the commercial fishing industry. The effect is straightforward: reducing the number of fish killed will increase the number of fish available for harvest. Measuring the benefits of this effect is less straightforward. The next section summarizes the methods EPA used to estimate benefits to the commercial fishing sector. The following section presents the estimated commercial fishing benefits for each region.

a. Methods. EPA estimated commercial benefits by first estimating the value of total losses under current impingement and entrainment conditions (or the total benefits of eliminating all impingement and entrainment). Then, based on review of the empirical literature, EPA assumed that producer surplus is equal to 0% to 40% of baseline losses. Finally, EPA estimated benefits by applying the estimated percentage reduction in impingement and entrainment to the estimated producer surplus to obtain the estimated increase in producer surplus attributable to the rule. This methodology was applied in each region in the final analysis: the North Atlantic, Mid-Atlantic, South Atlantic, Gulf of Mexico, California, Great Lakes, and Inland. Additional detail on the methods EPA used for this analysis can be found in Chapter A10 "Methods For Estimating Commercial Fishing Benefits" in the Regional Analysis Document.

The process used to estimate regional losses and benefits to commercial fisheries is as follows:

1. Estimate losses to commercial harvest (in pounds of fish) attributable to impingement and entrainment under current conditions. The basic approach is to apply a linear stock-to-harvest assumption, such that if 10% of the current commercially targeted stock were harvested, then 10% of the commercially targeted fish lost to impingement and entrainment would also have been harvested absent impingement and entrainment. The percentage of fish harvested is based on data on historical fishing mortality rates.

2. Estimate gross revenue of lost commercial catch. The approach EPA **[*41660]** uses to estimate

the value of the commercial catch lost due to impingement and entrainment relies on landings and dockside price ($/lb) as reported by NOAA Fisheries for the period 1991–2001. These data are used to estimate the revenue of the lost commercial harvest under current conditions (*i.e.*, the increase in gross revenue that would be expected if all impingement and entrainment impacts were eliminated).

3. Estimate lost economic surplus. The conceptually suitable measure of benefits is the sum of any changes in producer and consumer surplus. The methods used for estimating the change in surplus depend on whether the physical impact on the commercial fishery market appears sufficiently small such that it is reasonable to assume there will be no appreciable price changes in the markets for the impacted fisheries.

For the regions and magnitude of losses included in this analysis, it is reasonable to assume no change in price, which implies that the welfare change is limited to changes in producer surplus. The change in producer surplus is assumed to be equivalent to a portion of the change in gross revenues, as developed under step 2. EPA assumes a range of 0% to 40% of the gross revenue losses estimated in step 2 as a means of estimating the change in producer surplus. This is based on a review of empirical literature (restricted to only those studies that compared producer surplus to gross revenue) and is consistent with recommendations made in comments on the EPA analysis at proposal.

4. Estimate increase in surplus attributable to the Phase II regulations. Once the commercial surplus

losses associated with impingement and entrainment under baseline conditions have been estimated according to the approaches outlined in steps 2 and 3. EPA estimates the percentage reduction in impingement and entrainment at a regional level.

b. Results. Exhibit XII-4 presents the estimated commercial fishing benefits attributable to today's rule for each region. The results reported include the total reduction in losses in pounds of fish, and the value of this reduction discounted at 0%, 3%, and 7%. Total commercial fishing benefits for the U.S., applying a 3% discount rate, are estimated to range from $0 to $3.5 million. Applying a 7% rate they range from $0 to $3.5 million.

EXHIBIT XII-4.—ANNUAL COMMERCIAL FISHING BENEFITS[a]

Region[c]	Current (baseline) lost yield (million lbs)	Reduction in lost yield (million lbs)	Benefits (million of 2002$)[b]		
			0% Discount Rate	3% Discount Rate	7% Discount Rate
California	11.5	2.4	0.7	0.5	0.4
North Atlantic	0.6	0.2	0.1	0.1	0.0
Mid Atlantic	48.7	25.3	1.8	1.7	1.5
South Atlantic	9.6	3.5	0.2	0.2	0.2
Gulf of Mexico	7.6	3.6	0.8	0.7	0.6
Great Lakes	1.6	0.8	0.2	0.2	0.2
Inland	n/a	n/a	n/a	n/a	n/a
Total for 554 Facilities	82.8	37.0	4.1	3.5	3.0

[a] Benefits are upper bound benefits based on 40% of gross revenue. The lower bound is $0.

[b] Discounted to account for lag in implementation and lag in time required for fish lost to I&E to reach a harvestable age. Assumed it will take one year from the date when installation costs are incurred to the date of installation. Thus, all benefits are discounted by one year from the date when installation costs are incurred.

[c] Regional totals are unweighted. National total estimates are weighted and include Hawaii.

c. Limitations and uncertainties. Some of the major uncertainties and assumptions of EPA's commercial fishing analysis include:

- Projected changes in harvest may be underestimated because the cumulative impacts of impingement and entrainment over time are not considered.

- The analysis only includes individuals that are directly killed by impingement and entrainment, not their progeny, though given the complexities of population dynamics, the significance of this omission is not clear.

- Projected changes in harvest may be too high or too low because interactions with other stressors are not considered.

- EPA used impingement and entrainment data provided by the facilities. While EPA used the most current data available, in some cases these data are 20 years old or older. Thus, they may not reflect current conditions.

- EPA assumes a linear stock-to-harvest relationship (*i.e.*, a 13% change in stock would have a 13% change in landings); this may be low or high, depending on the condition of the stocks. Region-specific fisheries regulations also will affect the validity of the linear assumption.

- EPA assumes that NOAA Fisheries landings data are accurate and complete. However, in some cases prices and/or quantities may be reported incorrectly.

- EPA currently estimates that the increase in producer surplus as a result of the rule will be

between 0% and 40% of the estimated change in gross revenues. The research used to develop this range is not region-specific; thus the true value may be higher for some regions and species.

5. Non-Use Benefits

As discussed by Freeman (1993), "Non-use values, like use values, have their basis in the theory of individual preferences and the measurement of welfare changes. According to theory, use values and non-use values are additive," and "* * * there is a real possibility that ignoring non-use values could result in serious misallocation of resources." This statement by Freeman aptly conveys the importance of non-use benefits outlined in EPA's own economic valuation guidance documents. A comprehensive estimate of total resource value should include both use and non-use values, so that the resulting appropriate total benefit value estimates may be compared to total social cost.

It is clear that reducing impingement and entrainment losses of fish and shellfish may result in both use and non-use benefits. Of the organisms which are anticipated to be protected by the section 316(b) Phase II rule, it is projected that approximately 1.8 percent will eventually be harvested by commercial and recreational fishers and **[*41661]** therefore can be valued with direct use valuation techniques. The Agency's direct use valuation does not account for the benefits from the remaining 98.2% of the age 1 equivalent aquatic organisms estimated to be protected nationally under today's rule. A portion of the total benefits of these unharvested commercial, recreational, and forage species, can be derived indirectly from the

estimated use values of the harvested animals. A percentage of these unlanded organisms become prey or serve as breeding stock in the production of those commercial and recreational species that will eventually be caught, therefore their indirect use value as biological input into the production process is represented in the estimated direct use values of the harvested fish.

EPA was unable to value the non-use benefits associated with this rule. In order to provide an estimate of the quantified (but not monetized) effects of the rule, Exhibit XII-5 summarizes information about total impingement and entrainment losses, and Exhibit XII-6 presents estimates of reductions in impingement and entrainment losses under the final rule.

XII-5.—Distribution of Baseline Impingement and Entrainment

Region[a]	Current I&E of annual age-one equivalents (millions)				I&E of harvested species as a percentage of total I&E
	All species (total)	Forage species	Commercial and recreational species	Harvested commercial and recreational species	
California	312.9	170.6	142.3	14.9	4.8
North Atlantic	65.7	49.7	16.0	0.7	1.0
Mid Atlantic	1,733.1	1,115.6	617.6	28.4	1.6
South Atlantic	342.5	208.1	134.5	6.5	1.9
Gulf of Mexico	191.2	53.5	137.8	8.1	4.2
Great Lakes	319.1	300.8	18.3	0.5	0.2
Inland	369.0	284.8	84.2	0.2	0.1
Total for 554 Facilities[a]	3,449.4	2,255.8	1,193.6	62.1	1.8

[a] Regional totals are unweighted. National total estimates are weighted and include Hawaii.

EXHIBIT XII-6.—DISTRIBUTION OF REDUCTIONS IN IMPINGEMENT AND ENTRAINMENT

Region[a]	Reductions in I&E of annual age-one equivalents (millions)				Reduction in I&E of harvested species as a percentage of total reduction in I&E
	All species (total)	Forage species	Commercial and recreational species	Harvested commercial and recreational species	
California	66.4	36.0	30.4	3.2	4.8
North Atlantic	19.3	14.6	4.7	4.7	1.0
Mid Atlantic	846.4	537.5	308.8	13.9	1.6
South Atlantic	76.7	38.5	38.2	1.6	2.0
Gulf of Mexico	89.5	20.5	69.0	3.6	4.0
Great Lakes	159.5	151.7	7.8	0.2	0.1
Inland	116.8	101.2	15.7	0.1	0.1
Total for 554 Facilities[a]	1,420.2	928.9	491.3	23.7	1.7

[a] Regional totals are unweighted National total estimates are sample-weighted and include Hawaii.

Lack of direct use values for the unharvested commercial, recreational and forage species means that EPA did not directly value a substantial percentage of the total age-one equivalent impingement and entrainment losses. Given that aquatic organisms without any direct uses account for the majority of cooling water intake structure losses and indirect valuation of these species may only represent a fraction of their total value, comprehensive monetization of the benefits of reduced impingement and entrainment losses is incomplete without developing a reliable estimate of non-use benefits. Although individuals do not use these resources directly, they may value changes in their status or quality. Both users (commercial and recreational fishermen) as well as non-users (those who do not use the resource) may have non-use values for these species. Non-use benefit valuation is challenging, but the existence and potential importance of non-use benefits is supported by EPA's Guidelines for Preparing Economic Analysis (EPA 240-R-00-003) and OMB Circular A-4, Regulatory Analysis, also available as Appendix D of Informing Regulatory Decisions: 2003 Report to Congress on The Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local and Tribal Entities, OMB, 2003, pp 118–165.

Market valuation approaches are used to estimate use benefits. The theory and practice of nonmarket valuation is well developed, and typically plays a pivotal role in benefit-cost analysis conducted by public and private agencies. Non-use values are often considered more difficult to estimate. The preferred technique for estimating non-use values is to conduct original stated preference surveys, but

benefit transfer of values from existing stated preference studies can be considered when original studies are not feasible.

Stated preference methods rely on surveys, which ask people to state their willingness-to-pay for particular ecological improvements, such as increased protection of aquatic species or habitats with particular attributes. The Agency was not able to perform an original stated preference study for this regulation, so benefit transfer was explored as an alternative means to estimate non-use benefits. Benefits transfer involves adapting the findings from research conducted for another **[*41662]** purpose to address the policy questions in hand.

One of the specific benefit transfer techniques explored by EPA for estimation of non-use benefits in Phase II of the 316(b) rulemaking was meta regression analysis. Meta regressions are designed to statistically define the relationship between values and a set of resource, demographic and other characteristics compiled from original primary study sources. The resulting mathematical relationship allows the researcher to forecast estimates of non-use values specific to the resource changes projected to occur as a consequence of the final rule. EPA's Guidelines for Preparing Economic Analysis (EPA 240-R-00-003) discusses the use of meta-analysis and notes that this approach is the most rigorous benefit transfer exercise.

The meta analysis conducted by EPA for this rule identifies a set of elements that may influence willingness-to-pay; the analysis found both statistically significant and intuitive patterns that appeared to influence non-use values for water

quality improvements in aquatic habitats. However, the Agency encountered various limitations when trying to apply the meta analysis model to this final rule, and these limitations could not be thoroughly analyzed within the publication time-frame established for this rule. EPA therefore does not present estimates of non-use values for this final rule.

Due to the various difficulties associated with estimating indirect and non-use benefits for this rule, final benefits do not reflect reduced impacts to a variety of potential ecological and public services that are a function, in part, of healthy fish stocks and other organisms affected by cooling water intake structures. Examples of other potential ecosystem services that may potentially be adversely affected by impingement and entrainment losses but which could not be monetized include:

- Decreased numbers of ecological keystone, rare, or sensitive species;
- Increased numbers of exotic or disruptive species that compete well in the absence of species lost to I&E;
- Disruption of ecological niches and ecological strategies used by aquatic species;
- Disruption of organic carbon, nutrient, and energy transfer through the food web;
- Decreased local biodiversity;
- Disruption of predator-prey relationships;
- Disruption of age class structures of species; and

• Disruption of public satisfaction with a healthy ecosystem.

The existence and potential magnitude of each of these benefits categories is highly dependent on site-specific factors which could not be assessed.

Today's rule may help preserve threatened and endangered species, but primary research, using stated preference methods, and data collection regarding threatened and endangered species impacts, could not be conducted for the final rule at the national level. As a result, EPA explored other methods for valuing threatened and endangered species. Details about possible non-use benefits valuation approaches are presented in the 316(b) Regional Analysis document (DCN 6-0003).

6. National Monetized Benefits

Quantifying and monetizing reduction in impingement and entrainment losses due to today's final rule is extremely challenging, and the preceding sections discuss specific limitations and uncertainties associated with estimation of commercial and recreational benefits categories (presented in Exhibit XII-7), and non-use benefits. National benefit estimates are subject to uncertainties inherent in valuation approaches used for assessing the three benefits categories. The combined effect of these uncertainties is of unknown magnitude or direction (*i.e.*, the estimates may over or under state the anticipated national-level benefits); however, EPA has no data to indicate that the results for each benefit category are atypical or unreasonable.

Exhibit XII-7 presents EPA's estimates of the total monetized benefits from impingement and

entrainment reduction of the final regulation. Although EPA believes non-use benefits exist, the Agency was not able to monetize them. The estimated impingement and entrainment reduction monetized benefits post regulation are $83 million (2002$) per year, discounted at three percent, and $73 million, discounted at seven percent.

EXHIBIT XII-7.-SUMMARY OF MONETIZED SOCIAL BENEFITS

[Millions:2002$]

Region[a]	Commercial fishing benefits	Recreational fishing benefits	Total value of monetizable impingement and entrainment reductions[b]
Evaluated at a 3 percent discount rate			
California	$0.5	$2.5	$3.0
North Atlantic	0.1	1.4	1.5
Mid Atlantic	1.7	43.4	45.1
South Atlantic	0.2	6.9	7.1
Gulf of Mexico	0.7	6.2	6.9
Great Lakes	0.2	14.0	14.2
Inland	.....	3.0	3.0
Total for 554 Facilities	3.5	79.3	82.5
Evaluated at a 7 percent discount rate			
California	0.4	1.9	2.3

EXHIBIT XII-7.-SUMMARY OF MONETIZED SOCIAL BENEFITS—Continued

[Millions:2002$]

Region[a]	Commercial fishing benefits	Recreational fishing benefits	Total value of monetizable impingement and entrainment reductions[b]
North Atlantic	0.0	1.2	2.3
Mid Atlantic	1.5	38.5	40.0
South Atlantic	0.2	6.2	6.4
Gulf of Mexico	0.6	5.5	6.1
Great Lakes	0.2	12.2	12.4
Inland	.....	2.6	2.6
Total for 554 Facilities	3.0	70.0	73.0

[a] Regional benefit estimates are unweighted. National benefits are sample-weighted and include Hawaii.

[b] The monetized benefits of the final rule may be significantly under-estimated due to the inability to monetize the non-use values.

[*41663] *E. Other Considerations*

This section presents two additional analyses that consider the benefits and costs of the final rule: (1) An analysis of the costs per age-one equivalent fish saved (equivalent to a cost-effectiveness analysis) and (2) a break-even analysis of the minimum non-use benefits required for total annual benefits to equal total annualized costs, on a per household basis. Each measure is presented by study region.

1. Cost Per Age-One Equivalent Fish Saved—Cost-Effectiveness Analysis

EPA also analyzed the cost per organism saved as a result of compliance with the final rule. This analysis estimates the cost-effectiveness of the rule, by study region. Organisms saved are measured as "age-one equivalents." The costs used for the regional comparisons are the annualized pre-tax compliance costs incurred by facilities subject to the final rule, and the cost used for the national comparison is the total social cost of the final rule (including facility compliance costs and administrative costs).

Exhibit XII-8 shows that the estimated cost per age-one equivalent ranges from $0.07 in the Mid Atlantic region to $1.46 in the Inland region. At the national level, the estimated average cost is $0.27 per age-one equivalent saved.

EXHIBIT XII-8.-COST PER AGE-ONE EQUIVALENT SAVED

Study region[a]	Annual social cost[b] (millions; 2002$)	Age-one equivalents (millions)	Cost/age-one equivalent saved
California	$31.7	66.4	$0.48
North Atlantic	13.3	19.3	0.69
Mid Atlantic	62.6	846.4	0.07
South Atlantic	9.0	76.7	0.12
Gulf of Mexico	22.8	89.5	0.25
Great Lakes	58.7	159.5	0.37
Inland	170.4	116.8	1.46
Total for 554 Facilities	389.4	1,420	0.27

[a] Regional benefit and cost estimates are unweighted; total national estimates are sample-weighted and include Hawaii.

[b] The regional costs include only annual compliance costs incurred by facilities. The national cost includes the total social cost of the final rule (facility compliance costs and administrative costs).

2. Break-Even Analysis

Due to the uncertainties of providing estimates of the magnitude of non-use values associated with the final rule, this section provides an alternative approach of evaluating the potential relationship between benefits and costs. The approach used here applies a "break-even" analysis to identify what the unmonetized non-use values would have to be in order for the final rule to have benefits that are equal to costs.

The break-even approach uses EPA's estimated or monetized, commercial and recreational use benefits for the rule and subtracts them from the estimated annual compliance costs incurred by facilities subject to the final rule. The resulting "net cost" enables one to work backwards to estimate what the unmonetized non-use values would need to be (in terms of willingness-to-pay per household per year) in order for total annual benefits to equal annualized costs. Exhibit XII-9 provides this assessment for the seven study regions. The exhibit shows benefits values using a 3 percent social discount rate. Use of a 7% discount rate would produce somewhat higher breakeven numbers. Section XII.D.5 presents undiscounted benefits and benefits discounted using a 7 percent discount rate.

EXHIBIT XII-9.—IMPLICIT NON-USE VALUE—BREAK-EVEN ANALYSIS

[Million; 2002$]

Study region[a]	Use benefits[b]	Actual social cost[c]	Annual non-use benefits necessary to break even[d,g]	Number of households (millions)[e]	Annual break-even non-use WTP per household[f]
California	$3.0	$31.7	$28.7	8.1	$3.55
North Atlantic	1.4	13.3	11.9	3.9	3.02
Mid Atlantic	45.0	62.6	17.5	9.6	1.82
South Atlantic	7.1	9.0	1.9	3.8	0.50
Gulf of Mexico	6.9	22.8	15.9	5.4	2.92
Great Lakes	14.1	58.7	44.6	8.6	5.17
Inland	3.0	170.4	167.4	20.9	8.01
Total for 554 Facilities	82.9	389.4	306.5	60.4	5.07

[a] Regional benefit and cost estimates are unweighted; total national estimates are sample-weighted and include Hawaii.

[b] Benefits are discounted using a 3 percent discount rate.

[c] The regional costs include only annual compliance costs incurred by facilities. The national cost includes the total social cost of the final rule (facility compliance costs and administrative costs).

[d] Annualized compliance costs minus annual use benefits.

[e] Millions of households, including anglers fishing in the region and households in abutting counties. From U.S. Census 2000 (BLS): *http://factfinder.census.gov.*

[f] Dollars per household per year that, when added to use benefits, would yield a total annual benefit (use plus non-use) equal to the annualized costs.

[g] Non-use benefits may also include unmonetized use benefits, *i.e.*, improvements in bird watching.

[*41664] As shown in Exhibit XII-9, for total annual benefits to equal total annualized costs, non-use values per household would have to be $0.50 in the South Atlantic region and $8.01 in the Inland region. At the national level, the annual willingness-to-pay per affected household would have to be $5.07 for total annual benefits to equal total annualized costs.

While this approach of backing out the "break-even" non-use value per household does not answer the question of what non-use values might actually be for the final rule, these results do frame the question for policy-making decisions. The break-even approach poses the question: "Is the true per household willingness-to-pay for the non-use amenities (existence and bequest) associated with the final rule likely to be greater or less than the "breakeven" benefit levels displayed in Exhibit XII-9?" Unfortunately, the existing body of empirical research is inadequate to answer this question on behalf of the nation as a whole, but EPA is providing the analysis to aid policy makers and the public in forming their own judgment.

XIII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines a "significant regulatory action" as one that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a "significant regulatory action." As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

B. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2060.02, or DCN 6-0001. Compliance with the applicable information collection requirements imposed under this final rule (see §§ 122.21(r), 125.95, 125.96, 125.97, 125.98, 125.99) is mandatory. Existing facilities are required to perform several data-gathering activities as part of the permit renewal application process.

Today's final rule requires several distinct types of information collection as part of the NPDES renewal application. In general, the information will be used to identify which of the requirements in today's final rule apply to the existing facility, how the existing facility will meet those requirements, and whether the existing facility's cooling water intake structure reflects the best technology available for minimizing adverse environmental impact. Categories of data required by today's final rule follow.

- Source waterbody data for determining appropriate requirements to apply to the facility, evaluating ambient conditions, and characterizing potential for impingement and entrainment of all life stages of fish and shellfish by the cooling water intake structure;

- Intake structure and cooling water system data, consisting of intake structure design, cooling water system operational data and relationship of each intake to the cooling water system, and a facility water balance diagram, to determine appropriate requirements and characterize potential for impingement and entrainment of all life stages of fish and shellfish;

- Information on design and construction technologies implemented to ensure compliance with applicable requirements set forth in today's final rule; and

- Information on supplemental restoration measures proposed for use with design and construction technologies or alone to minimize adverse environmental impact.

In addition to the information requirements of the permit renewal application, NPDES permits normally **[*41665]** specify monitoring and reporting requirements to be met by the permitted entity. Existing facilities that fall within the scope of this final rule would be required to perform biological monitoring for at least two years, and as required by the Director, to demonstrate compliance. Additional ambient water quality monitoring may also be required of facilities depending on the specifications of their permits. The facility is expected to analyze the results from its monitoring efforts and provide these results in a bi-annual status report to the permitting authority. Finally, facilities are required to maintain records of all submitted documents, supporting materials, and monitoring results for at least three years. (Note that the Director may require more frequent reporting and that records be kept for a longer period to coincide with the life of the NPDES permit.)

All facilities carry out the activities necessary to fulfill the general information collection requirements. The estimated burden includes developing a water balance diagram that can be used to identify the proportion of intake water used for cooling, make-up, and process water. Facilities will also gather data (as required by the compliance alternative selected) to calculate the reduction in impingement mortality and entrainment of all life stages of fish and shellfish that would be achieved by the technologies and operational measures they select. The burden estimates include sampling, assessing the source waterbody, estimating the magnitude of impingement mortality and entrainment, and reporting results in a

comprehensive demonstration study. For some facilities, the burden also includes conducting a pilot study to evaluate the suitability of the technologies and operational measures based on the species that are found at the site.

Some of the facilities (those choosing to use restoration measures to maintain fish and shellfish) will need to prepare a plan documenting the restoration measures they implement and how they demonstrate that the restoration measures are effective. Restoration is a voluntary alternative. Since facilities would most likely choose restoration only if other alternatives are more costly or infeasible, EPA has not assessed facility burden for this activity. However, burden estimates have been included for the Director's review of restoration activities.

Some facilities may choose to request a site-specific determination of best technology available because of costs significantly greater than those EPA considered in establishing the performance standards or because costs are significantly greater than the benefits of complying with the performance standards. These facilities must perform a comprehensive cost evaluation study and submit a site-specific technology plan characterizing the design and construction technologies, operational measures and/or restoration measures they have selected. In addition, facilities that request a site-specific determination because of costs significantly greater than the benefits must also perform a valuation of the monetized benefits of reducing impingement mortality and entrainment and an assessment of non-monetized benefits. Site-specific

determinations are voluntary. Since facilities would choose site-specific determinations only if other alternatives are more costly, EPA has not assessed a facility burden for these activities; however, EPA has incorporated burden into the activities that the Director will perform in reviewing site-specific information.

The total average annual burden of the information collection requirements associated with today's final rule is estimated at 1,700,392 hours. The annual average reporting and record keeping burden for the collection of information by facilities responding to the section 316(b) Phase II existing facility final rule is estimated to be 5,428 hours per respondent (*i.e.*,, an annual average of 1,595,786 hours of burden divided among an anticipated annual average of 294 facilities). The Director reporting and record keeping burden for the review, oversight, and administration of the rule is estimated to average 2,615 hours per respondent (*i.e.*, an annual average of 104,606 hours of burden divided among an anticipated 40 States on average per year).

Respondent activities are separated into those activities associated with the NPDES permit application and those activities associated with monitoring and reporting after the permit is issued. The reason for this is that the permit cycle is every five years, while Information Collection Requests (ICRs) must be renewed every three years. Therefore, the application activities occur only once per facility during an ICR approval period, and so they are considered one-time burden for the purpose of this ICR. By contrast, the monitoring and

reporting activities that occur after issuance of the permit occur on an annual basis. The burden and costs are for the information collection, reporting, and recordkeeping requirements for the three-year period beginning with the effective date of today's rule. Additional information collection requirements will occur after this initial three-year period as existing facilities continue to be issued permit renewals and such requirements will be counted in a subsequent information collection request. EPA does not consider the specific data that would be collected under this final rule to be confidential business information. However, if a respondent does consider this information to be confidential, the respondent may request that such information be treated as confidential. All confidential data will be handled in accordance with 40 CFR 122.7, 40 CFR Part 2, and EPA's Security Manual Part III, Chapter 9, dated August 9, 1976.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information, unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9. EPA is amending the table in 40 CFR Part 9 of currently approved OMB control numbers for various regulations to list the information requirements contained in this final rule.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 *et seq.*, generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. For the purposes of assessing the impacts of today's rule on **[*41666]** small entities, small entity is defined as: (1) A small business according to RFA default definitions for small business (based on Small Business Administration (SBA) size standards); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This final rule applies to existing power producing facilities that employ a cooling water intake structure and are design to withdraw 50 million gallons per day (MGD) or more from waters of the United States for cooling purposes. EPA expects this final rule to regulate 25 small entities that own electric generators. We estimate that 17 of the small entities are governmental jurisdictions (*i.e.*, 16 municipalities and one political subdivision), two are private businesses (*i.e.*, one nonutility and one investor-owned entity), and six are not-for-profit enterprises (*i.e.*, rural electric cooperative).

Of the 25 small entities, one entity is estimated to incur annualized post-tax compliance costs of greater than three percent of revenues; eight are estimated to incur compliance costs of between one and three percent of revenues; and 16 small entities are estimated to incur compliance costs of less than one percent of revenues. Eleven small entities are estimated to incur no costs other than permitting and monitoring costs.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small entities. EPA has divided implementation of section 316(b) of the Clean Water Act (CWA) into three phases where the majority of small entities will be addressed in Phase III. Under the Phase III rule, EPA will convene a

SBREFA panel that will evaluate impacts to small entities.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of

affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant intergovernmental mandates, and informing, educating, and advising small governments on compliance with regulatory requirements.

EPA estimates the total annualized (post-tax) costs of compliance for facilities subject to the final rule to be $249.5 million (2002$), of which $216.3 million is incurred by the private sector (including investor-owned utilities, nonutilities, and rural electric cooperatives) and $23.1 million is incurred by State and local governments that operate in-scope facilities.[59] Additionally, permitting authorities incur $4.1 million to administer the rule, including labor costs to write permits and to conduct compliance monitoring and enforcement activities. EPA estimates that the highest undiscounted post-tax cost incurred by the private sector in any one year is approximately $419.1 million in 2009. The highest undiscounted cost incurred by the government sector in any one year is approximately $43.5 million in 2008. Thus, EPA has determined that this rule contains a Federal mandate that may result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any one year. Accordingly, EPA has prepared a written statement under § 202 of the UMRA, which is summarized as

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[59] In addition, 14 facilities owned by Tennessee Valley Authority (TVA), a Federal entity, incur $10.1 million in compliance costs. The costs incurred by the Federal government are not included in this section.

follows. See Economic and Benefits Analysis, Chapter B5, UMRA Analysis, for detailed information.

FN59

1. Summary of Written Statement

a. Authorizing Legislation

This final rule is issued under the authority of sections 101, 301, 304, 306, 308, 316, 401, 402, 501, and 510 of the Clean Water Act (CWA), 33 U.S.C. 1251, 1311, 1314, 1316, 1318, 1326, 1341, 1342, 1361, and 1370. This rule partially fulfills the obligations of the U.S. Environmental Protection Agency (EPA) under a consent decree in *Riverkeeper, Inc. et al.* v. *Whitman*, United States District Court, Southern District of New York, No. 93 Civ. 0314. See section III of this preamble for detailed information on the legal authority of this regulation.

b. Cost-Benefit Analysis

The final rule is expected to have total annualized pre-tax (social) costs of $389.2 million (2002$), including direct costs incurred by facilities and implementation costs incurred by State and Federal governments. The total use benefits of the rule are estimated to be $82.9 million. EPA was not able to estimate the monetary value of non-use benefits resulting from the rule, although the Agency believes non-use benefits may be significant. Thus, the total social costs exceed the total use benefits of the rule by $306.3 million, and the benefit-cost ratio, calculated by dividing total use benefits by total social costs, is 0.2. EPA notes that these analyses are based on a comparison of a partial measure of benefits with a complete measure of costs; therefore,

the results must be interpreted with caution. For a more detailed comparison of the costs and benefits of the final rule, refer to section XII.E of this preamble.

EPA notes that States may be able to use existing sources of financial assistance to revise and implement the final rule. Section 106 of the Clean Water Act authorizes EPA to award grants to States, Tribes, intertribal consortia, and interstate agencies for administering programs for the prevention, reduction, and elimination of water pollution. These grants may be used for various activities to develop **[*41667]** and carry out a water pollution control program, including permitting, monitoring, and enforcement. Thus, State and Tribal NPDES permit programs represent one type of State program that can be funded by grants.

c. Macro-Economic Effects

EPA estimates that this regulation will not have an effect on the national economy, including productivity, economic growth, employment and job creation, and international competitiveness of U.S. goods and services. Macroeconomic effects on the economy are generally not considered to be measurable unless the total economic impact of a rule reaches at least 0.25 percent to 0.5 percent of Gross Domestic Product (GDP). In 2002, U.S. GDP was $10.4 trillion (2002 $), according to the U.S. Bureau of Labor Statistics. Thus, in order to be considered measurable, the final rule would have to generate costs of at least $26 billion to $52 billion. Since EPA estimates the final rule will generate total annual pre-tax costs of only $389.2 million, the Agency does not believe that the final rule will have an effect on the national economy.

d. Summary of State, Local, and Tribal Government Input

EPA consulted with State governments and representatives of local governments in developing the regulation. The outreach activities are discussed in section III of this preamble.

e. Least Burdensome Option

EPA considered and analyzed several alternative regulatory options to determine the best technology available for minimizing adverse environmental impact. These regulatory options are discussed in the proposed rule at 67 FR 17154-17168, as well as in section VII of this preamble. These options included a range of technology-based approaches (*e.g.*, reducing intake flow to a level commensurate with the use of a closed-cycle cooling system for all facilities; facilities located on certain waterbody types; facilities located on certain waterbody types that withdraw a specified percentage of flow; and the use of impingement and entrainment controls at all facilities). EPA also included consideration of at least four distinct site-specific options, including several proposed by industry. As discussed in detail in section VII., EPA did not select these options because ultimately they are not the most cost-effective among the options that fulfill the requirements of section 316(b). EPA selected the final rule because it meets the requirement of section 316(b) of the CWA that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact, and it is economically practicable. EPA believes the final rule reflects the most cost-effective and flexible approach

among the options considered. By providing five compliance alternatives the final rule offers Phase II existing facilities a high degree of flexibility in selecting the most cost-effective approach to meeting section 316(b) requirements. Under the rule, these facilities can demonstrate that existing flow or CWIS technologies fulfill section 316(b), identify design and control technologies, and/or use operational measures or restoration measures to fulfill the rule requirements. The final rule also ensures that any applicable requirements are economically practicable through the inclusion of the site-specific compliance alternative at § 125.94(a)(5). EPA further notes that the compliance alternative specified in § 125.94(a)(4) and 125.99(a) and (b) was included in part to provide additional flexibility to Phase II existing facilities as well as to reduce the burden of determining, implementing, and administering section 316(b) requirements among all relevant parties. Finally, the Agency believes that the rule extends additional flexibility to States by providing that where a State has adopted alternative regulatory requirements that achieve environmental performance comparable to that required under the rule, the Administrator will approve such alternative requirements.

2. Impact on Small Governments

EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. EPA estimates that 17 of the 62 government-owned facilities subject to the final rule are owned by small governments (*i.e.*, governments with a population of less than 50,000). The total annualized post-tax compliance cost for all small government-owned facilities

incurring costs under the final rule is $5.4 million, or approximately $316,000 per facility. The highest annualized compliance costs for a small government-owned facility is $1.3 million. These costs are lower than the corresponding costs for large governments and private entities. EPA therefore concludes that these costs do not significantly or uniquely affect small governments, and that today's rule is not subject to the requirement of section 203 of UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Rather, this rule would result in minimal administrative costs on States that have an authorized NPDES program; would result in minimal costs to States and local government entities that own facilities subject to the regulation; it maintains the existing relationship between the

national government and the States in the administration of the NPDES program; and it preserves the existing distribution of power and responsibilities among various levels of government. Thus, Executive Order 13132 does not apply to this rule.

The national cooling water intake structure requirements will be implemented through permits issued under the NPDES program. Forty-five States and the Virgin Islands are currently authorized pursuant to section 402(b) of the CWA to implement the NPDES program. In States not authorized to implement the NPDES program, EPA issues NPDES permits. Under the CWA, States are not required to become authorized to administer the NPDES program. Rather, such authorization (and potential funding to support administration) is available to States if they operate their programs in a manner consistent with section 402(b) and applicable regulations. Generally, these provisions require that State NPDES programs include requirements that are as stringent as Federal program requirements. States retain the ability to implement requirements that are broader in scope or more stringent than Federal requirements. (See section 510 of the CWA). EPA expects an average annual burden of 104,606 hours with total average annual cost of $4.8 million **[*41668]** for States to collectively administer this rule during the first three years after promulgation.

EPA has identified 62 Phase II existing facilities that are owned by State or local government entities. The estimated average annual compliance cost incurred by these facilities is $372,000 per facility.

Today's rule would not have substantial direct effects on either authorized or nonauthorized States or on local governments because it would not change how EPA and the States and local governments interact or their respective authority or responsibilities for implementing the NPDES program. Today's rule establishes national requirements for Phase II existing facilities with cooling water intake structures. NPDES-authorized States that currently do not comply with the final regulations based on today's rule will need to amend their regulations or statutes to ensure that their NPDES programs are consistent with Federal requirements. See 40 CFR 123.62(e).

For purposes of this rule, the relationship and distribution of power and responsibilities between the Federal government and the States and local governments are established under the CWA (*e.g.*, sections 402(b) and 510), and nothing in this rule alters this established relationship and distribution of power and responsibilities. Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

Although Executive Order 13132 does not apply to this rule, EPA did consult with representatives of State and local governments in developing this rule. EPA also met with the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and, with the assistance of ASIWPCA, conducted a conference call in which representatives from 17 States or interstate organizations participated. A summary of consultation activities is provided in section III of this preamble. In the spirit of Executive Order 13132, and consistent with EPA

policy to promote communications between EPA and State and local governments, EPA also specifically solicited comments on the proposed rule from State and local officials. A summary of the concerns raised during that consultation and subsequent public comment periods and EPA's response to those concerns is provided in section VIII of this preamble and in the response to comment document in the record.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." "Policies that have tribal implications" are defined in the Executive Order to include regulations that have "substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and the Indian tribes, or the distribution of power and responsibilities between Federal government and Indian tribes."

This rule does not have Tribal implications. It will not have substantial direct effects on Tribal governments, on the relationship between the Federal government and the Indian Tribes, or the distribution of power and responsibilities between the Federal government and Indian Tribes as specified in Executive Order 13175. The national cooling water intake structure requirements will be implemented through permits issued under the

NPDES program. No Tribal governments are currently authorized pursuant to section 402(b) of the CWA to implement the NPDES program. In addition, EPA's analyses show that no facility subject to this rule is owned by Tribal governments and thus this rule does not affect Tribes in any way in the foreseeable future. Thus, Executive Order 13175 does not apply to this rule.

Nevertheless, in the spirit of Executive Order 13175 and consistent with EPA policy to promote communications between EPA and Tribal governments, EPA solicited comment on the proposed rule from all stakeholders. EPA did not receive any comments from Tribal governments.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045: "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

Executive Order 13045 does not apply to this rule because the rule does not concern an environmental health or safety risk that EPA has reason to believe

may have a disproportionate effect on children. This rule establishes requirements for cooling water intake structures to protect aquatic organisms.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a "significant energy action" as defined in Executive Order 13211, ("Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355, May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The final rule does not contain any compliance requirements that will:

- Reduce crude oil supply in excess of 10,000 barrels per day;
- Reduce fuel production in excess of 4,000 barrels per day;
- Reduce coal production in excess of 5 million tons per day;
- Reduce electricity production in excess of 1 billion kilowatt hours per day or in excess of 500 megawatts of installed capacity;
- Increase energy prices in excess of 10 percent;
- Increase the cost of energy distribution in excess of 10 percent;
- Significantly increase dependence on foreign supplies of energy; or
- Have other similar adverse outcomes, particularly unintended ones.

EPA analyzed the final rule for each of these potential effects and found that this rule will not lead to any adverse outcomes. Based on the analyses, EPA concludes that this final rule will have minimal energy effects at a national and regional level. As a result, EPA did not prepare a Statement of Energy Effects. For more detail on the potential energy effects of this rule, see section XI.B.1 of this preamble or the *Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule*.

I. National Technology Transfer and Advancement Act

As noted in the proposed rule, section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Pub. L. No. 104-113, section 12(d), (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless to do so **[*41669]** would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through the Office of Management and Budget (OMB), explanations when the Agency decides not to use available and applicable voluntary consensus standards. This rule does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 requires that, to the greatest extent practicable and permitted by law, each Federal agency must make achieving environmental justice part of its mission. E.O. 12898 states that each Federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

Today's final rule would require that the location, design, construction, and capacity of cooling water intake structures (CWIS) at Phase II existing facilities reflect the best technology available for minimizing adverse environmental impact. For several reasons, EPA does not expect that this final rule would have an exclusionary effect, deny persons the benefits of participating in a program, or subject persons to discrimination because of their race, color, or national origin.

To assess the impact of the rule on low-income and minority populations, EPA calculated the poverty rate and the percentage of the population classified as non-white for populations living within a 50-mile radius of each of the 543 in-scope facilities for which survey data are available. The results of the

analysis, presented in the Economic Benefits Analysis, show that the populations affected by the in-scope facilities have poverty levels and racial compositions that are quite similar to the U.S. population as a whole. A relatively small subset of the facilities are located near populations with poverty rates (23 of 543, or 4.2%), or non-white populations (105 of 543, or 19.3%), or both (13 of 543, or 2.4%) that are significantly higher than national levels. Based on these results, EPA does not believe that this rule will have an exclusionary effect, deny persons the benefits of the NPDES program, or subject persons to discrimination because of their race, color, or national origin.

In fact, because EPA expects that this final rule would help to preserve the health of aquatic ecosystems located in reasonable proximity to Phase II existing facilities, it believes that all populations, including minority and low-income populations, would benefit from improved environmental conditions as a result of this rule. Under current conditions, EPA estimates over 1.5 billion fish (expressed as age 1 equivalents) of recreational and commercial species are lost annually due to impingement and entrainment at the inscope Phase II existing facilities. Under the final rule, more than 0.5 billion individuals of these commercially and recreationally sought fish species (age 1 equivalents) will now survive to join the fishery each year. These additional fish will provide increased opportunities for subsistence anglers to increase their catch, thereby providing some benefit to low income households located near regulation-impacted waters.

K. : Marine Protected Areas

Executive Order 13158 (65 FR 34909, May 31, 2000) requires EPA to "expeditiously propose new science-based regulations, as necessary, to ensure appropriate levels of protection for the marine environment." EPA may take action to enhance or expand protection of existing marine protected areas and to establish or recommend, as appropriate, new marine protected areas. The purpose of the Executive Order is to protect the significant natural and cultural resources within the marine environment, which means "those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands thereunder, over which the United States exercises jurisdiction, consistent with international law."

Today's final rule recognizes the biological sensitivity of tidal rivers, estuaries, oceans, and the Great Lakes and their susceptibility to adverse environmental impact from cooling water intake structures. This rule provides the most stringent requirements to minimize adverse environmental impact for cooling water intake structures located on these types of waterbodies, including potential reduction of intake flows to a level commensurate with that which can be attained by a closed-cycle recirculating cooling system for facilities that withdraw certain proportions of water from estuaries, tidal rivers, and oceans.

EPA expects that this rule will reduce impingement mortality and entrainment at facilities with design intake flows of 50 MGD or more. The rule would afford protection of aquatic organisms at individual, population, community, or ecosystem

levels of ecological structure. Therefore, EPA expects today's rule would advance the objective of the Executive Order to protect marine areas.

L. Congressional Review Act

The Congressional Review Act, 5. U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule can not take effect until 60 days after it is published in the **Federal Register**. This action is a "major rule" as defined by . This will be effective September 7, 2004.

Dated: February 16, 2004.

Michael O. Leavitt,

Administrator.

Note: The following appendices A and B will not appear in the Code of Federal Regulations.

Appendix A

[41670]* * * *

[41680] Appendix B: Facility ID and Facility Name for All Facilities Not Claiming Survey Information CBI

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[*41682]

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List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 122

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous substances, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 123

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous substances, Indians-lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 124

Environmental protection, Administrative practice and procedure, Air pollution control, Hazardous waste, Indians-lands, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 125

Environmental protection, Cooling water intake structure, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

■ For the reasons set forth in the preamble, chapter I of title 40 of the Code of Federal Regulations is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

* * * *

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

■ 2. Section 122.21 is amended by revising paragraph (r)(1) and by adding a new paragraph (r)(5) to read as follows:

§ 122.21 Application for a permit (applicable to State programs, see § 123.25)

* * * * *

(r) *Application requirements for facilities with cooling water intake structures*—(1)(i) New facilities with new or modified cooling water intake structures. New facilities with cooling water intake structures as defined in part 125, subpart I, of this chapter must submit to the Director for review the information required under paragraphs (r)(2), (3), and (4) of this section and § 125.86 of this chapter as part of their application. Requests for alternative requirements under § 125.85 of this chapter must be submitted with your permit application.

(ii) *Phase II existing facilities.* Phase II existing facilities as defined in part 125, subpart J, of this chapter must submit to the Director for review the information required under paragraphs (r)(2), (3), and (5) of this section and all applicable provisions of § 125.95 of this chapter as part of their application except for the Proposal for Information Collection which must be provided in accordance with § 125.95(b)(1).

* * * * *

(5) *Cooling water system data.* Phase II existing facilities as defined in part 125, subpart J of this chapter must provide the following information for each cooling water intake structure they use:

(i) A narrative description of the operation of the cooling water system, its relationship to cooling water intake structures, the proportion of the design intake flow that is used in the system, the number of days of the year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable; and

(ii) Design and engineering calculations prepared by a qualified professional and supporting data to support the description required by paragraph (r)(5)(i) of this section.

■ 3. Section 122.44 is amended by revising paragraph (b)(3) to read as follows:

§ 122.44 Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(3) Requirements applicable to cooling water intake structures under section 316(b) of the CWA, in accordance with part 125, subparts I and J, of this chapter.

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PART 123—STATE PROGRAM REQUIREMENTS

■ 1. The authority citation for part 123 continues to read as follows:

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

■ 2. Section 123.25 is amended by revising paragraphs (a)(4) and (36) to read as follows:

§ 1233.25 Requirements for permitting.

(a) * * *

(4) § 122.21(a)–(b), (c)(2), (e)–(k), (m)–(p), (q), and (r)—(Application for a permit);

* * * * *

(36) Subparts A, B, D, H, I, and J of part 125 of this chapter;

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PART 124—PROCEDURES FOR DECISIONMAKING

■ 1. The authority citation for part 124 continues to read as follows:

[*41683] Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Safe Drinking Water Act, 42 U.S.C. 300f *et seq.*; Clean Water Act,

33 U.S.C. 1251 *et seq.*; Clean Air Act, 42 U.S.C. 7401 *et seq.*

■ 2 Section 124.10 is amended by revising paragraph (d)(1)(ix) to read as follows:

§ 124.10 Public notice of permit actions and public comment period.

* * * * *

(d) * * *

(1) * * *

(ix) Requirements applicable to cooling water intake structures under section 316(b) of the CWA, in accordance with part 125, subparts I and J, of this chapter.

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PART 125—CRITERIA AND STANDARDS FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 1. The authority citation for part 125 continues to read as follows:

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*; unless otherwise noted.

■ 2. Add subpart J to part 125 to read as follows:

Subpart J—Requirements Applicable to Cooling Water Intake Structures for Phase II Existing Facilities Under Section 316(b) of the Act

Sec.

125.90 What are the purpose and scope of this subpart?

125.91 What is a "Phase II existing facility"?
125.92 [Reserved]
125.93 What special definitions apply to this subpart?
125.94 How will requirements reflecting best technology available for minimizing adverse environmental impact be established for my Phase II existing facility?
125.95 As an owner or operator of a Phase II existing facility, what must I collect and submit when I apply for my reissued NPDES permit?
125.96 As an owner or operator of a Phase II existing facility, what monitoring must I perform?
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125.99 What are approved design and construction technologies?

Subpart J—Requirements Applicable to Cooling Water Intake Structures for Phase II Existing Facilities Under Section 316(b) of the Act

§ 125.90 What are the purpose and scope of this subpart?

(a) This subpart establishes requirements that apply to the location, design, construction, and capacity of cooling water intake structures at existing facilities that are subject to this subpart (*i.e.*, Phase II existing facilities). The purpose of these requirements is to establish the best technology available for minimizing adverse environmental impact associated with the use of

cooling water intake structures. These requirements are implemented through National Pollutant Discharge Elimination System (NPDES) permits issued under section 402 of the Clean Water Act (CWA).

(b) Existing facilities that are not subject to requirements under this or another subpart of this part must meet requirements under section 316(b) of the CWA determined by the Director on a case-by-case, best professional judgment (BPJ) basis.

(c) *Alternative regulatory requirements.* Notwithstanding any other provision of this subpart, if a State demonstrates to the Administrator that it has adopted alternative regulatory requirements in its NPDES program that will result in environmental performance within a watershed that is comparable to the reductions of impingement mortality and entrainment that would otherwise be achieved under § 125.94, the Administrator must approve such alternative regulatory requirements.

(d) Nothing in this subpart shall be construed to preclude or deny the right of any State or political subdivision of a State or any interstate agency under section 510 of the CWA to adopt or enforce any requirement with respect to control or abatement of pollution that is not less stringent than those required by Federal law.

§ 125.91 What is a "Phase II Existing Facility"?

(a) An existing facility, as defined in § 125.93, is a Phase II existing facility subject to this subpart if it meets each of the following criteria:

(1) It is a point source.

(2) It uses or proposes to use cooling water intake structures with a total design intake flow of 50 million gallons per day (MGD) or more to withdraw cooling water from waters of the United States;

(3) As its primary activity, the facility both generates and transmits electric power, or generates electric power but sells it to another entity for transmission; and

(4) It uses at least 25 percent of water withdrawn exclusively for cooling purposes, measured on an average annual basis.

(b) In the case of a Phase II existing facility that is co-located with a manufacturing facility, only that portion of the combined cooling water intake flow that is used by the Phase II facility to generate electricity for sale to another entity will be considered for purposes of determining whether the 50 MGD and 25 percent criteria in paragraphs (a)(2) and (4) of this section have been exceeded.

(c) Use of a cooling water intake structure includes obtaining cooling water by any sort of contract or arrangement with one or more independent suppliers of cooling water if the supplier withdraws water from waters of the United States but is not itself a Phase II existing facility, except as provided in paragraph (d) of this section. This provision is intended to prevent circumvention of these requirements by creating arrangements to receive cooling water from an entity that is not itself a Phase II existing facility.

(d) Notwithstanding paragraph (c) of this section, obtaining cooling water from a public water system or using treated effluent as cooling water does not

constitute use of a cooling water intake structure for purposes of this subpart.

§ 125.92 [Reserved]

§ 125.93 What special definitions apply to this subpart?

In addition to the definitions provided in § 122.3 of this chapter, the following special definitions apply to this subpart:

Adaptive management method is a type of project management method where a facility chooses an approach to meeting the project goal, monitors the effectiveness of that approach, and then based on monitoring and any other relevant information, makes any adjustments necessary to ensure continued progress toward the project's goal. This cycle of activity is repeated as necessary to reach the project's goal.

Annual mean flow means the average of daily flows over a calendar year.

All life stages means eggs, larvae, juveniles, and adults.

Calculation baseline means an estimate of impingement mortality and entrainment that would occur at your site assuming that: the cooling water system has been designed as a once-**[*41684]**through system; the opening of the cooling water intake structure is located at, and the face of the standard 3/8 -inch mesh traveling screen is oriented parallel to, the shoreline near the surface of the source waterbody; and the baseline practices, procedures, and structural configuration are those that your facility would maintain in the absence of any

structural or operational controls, including flow or velocity reductions, implemented in whole or in part for the purposes of reducing impingement mortality and entrainment. You may also choose to use the current level of impingement mortality and entrainment as the calculation baseline. The calculation baseline may be estimated using: historical impingement mortality and entrainment data from your facility or from another facility with comparable design, operational, and environmental conditions; current biological data collected in the waterbody in the vicinity of your cooling water intake structure; or current impingement mortality and entrainment data collected at your facility. You may request that the calculation baseline be modified to be based on a location of the opening of the cooling water intake structure at a depth other than at or near the surface if you can demonstrate to the Director that the other depth would correspond to a higher baseline level of impingement mortality and/or entrainment.

Capacity utilization rate means the ratio between the average annual net generation of power by the facility (in MWh) and the total net capability of the facility to generate power (in MW) multiplied by the number of hours during a year. In cases where a facility has more than one intake structure, and each intake structure provides cooling water exclusively to one or more generating units, the capacity utilization rate may be calculated separately for each intake structure, based on the capacity utilization of the units it services. Applicable requirements under this subpart would then be determined separately for each intake structure. The average annual net generation should be measured over a five year

period (if available) of representative operating conditions, unless the facility makes a binding commitment to maintain capacity utilization below 15 percent for the life of the permit, in which case the rate may be based on this commitment. For purposes of this subpart, the capacity utilization rate applies to only that portion of the facility that generates electricity for transmission or sale using a thermal cycle employing the steam water system as the thermodynamic medium.

Closed-cycle recirculating system means a system designed, using minimized make-up and blowdown flows, to withdraw water from a natural or other water source to support contact and/or noncontact cooling uses within a facility. The water is usually sent to a cooling canal or channel, lake, pond, or tower to allow waste heat to be dissipated to the atmosphere and then is returned to the system. (Some facilities divert the waste heat to other process operations.) New source water (make-up water) is added to the system to replenish losses that have occurred due to blowdown, drift, and evaporation.

Cooling water means water used for contact or noncontact cooling, including water used for equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The intended use of the cooling water is to absorb waste heat rejected from the process or processes used, or from auxiliary operations on the facility's premises. Cooling water that is used in a manufacturing process either before or after it is used for cooling is considered process water for the purposes of

calculating the percentage of a facility's intake flow that is used for cooling purposes in .

Cooling water intake structure means the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the U.S. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps.

Design and construction technology means any physical configuration of the cooling water intake structure, or a technology that is placed in the water body in front of the cooling water intake structure, to reduce impingement mortality and/or entrainment. Design and construction technologies include, but are not limited to, location of the intake structure, intake screen systems, passive intake systems, fish diversion and/or avoidance systems, and fish handling and return systems. Restoration measures are not design and construction technologies for purposes of this definition.

Design intake flow means the value assigned (during the cooling water intake structure design) to the total volume of water withdrawn from a source waterbody over a specific time period.

Design intake velocity means the value assigned (during the design of a cooling water intake structure) to the average speed at which intake water passes through the open area of the intake screen (or other device) against which organisms might be impinged or through which they might be entrained.

Diel means daily and refers to variation in organism abundance and density over a 24-hour period due to the influence of water movement, physical or chemical changes, and changes in light intensity.

Entrainment means the incorporation of any life stages of fish and shellfish with intake water flow entering and passing through a cooling water intake structure and into a cooling water system.

Estuary means a semi-enclosed body of water that has a free connection with open seas and within which the seawater is measurably diluted with fresh water derived from land drainage. The salinity of an estuary exceeds 0.5 parts per thousand (by mass) but is typically less than 30 parts per thousand (by mass).

Existing facility means any facility that commenced construction as described in on or before January 17, 2002; and any modification of, or any addition of a unit at such a facility that does not meet the definition of a new facility at § 125.83.

Freshwater river or stream means a lotic (free-flowing) system that does not receive significant inflows of water from oceans or bays due to tidal action. For the purposes of this rule, a flow-through reservoir with a retention time of 7 days or less will be considered a freshwater river or stream.

Impingement means the entrapment of any life stages of fish and shellfish on the outer part of an intake structure or against a screening device during periods of intake water withdrawal.

Lake or reservoir means any inland body of open water with some minimum surface area free of

rooted vegetation and with an average hydraulic retention time of more than 7 days. Lakes or reservoirs might be natural water bodies or impounded streams, usually fresh, surrounded by land or by land and a man-made retainer (*e.g.*, a dam). Lakes or reservoirs might be fed by rivers, streams, springs, and/or local precipitation.

Moribund means dying; close to death.

Natural thermal stratification means the naturally occurring and/or existing division of a waterbody into horizontal layers of differing densities as a result of variations in temperature at different depths.

Ocean means marine open coastal waters with a salinity greater than or **[*41685]** equal to 30 parts per thousand (by mass).

Once-through cooling water system means a system designed to withdraw water from a natural or other water source, use it at the facility to support contact and/or noncontact cooling uses, and then discharge it to a waterbody without recirculation. Once-through cooling systems sometimes employ canals/channels, ponds, or non-recirculating cooling towers to dissipate waste heat from the water before it is discharged.

Operational measure means a modification to any operation at a facility that serves to minimize impact to fish and shellfish from the cooling water intake structure. Examples of operational measures include, but are not limited to: reductions in cooling water intake flow through the use of variable speed pumps and seasonal flow reductions or shutdowns; and more frequent rotation of traveling screens.

Phase II existing facility means any existing facility that meets the criteria specified in .

Source water means the waters of the U.S. from which the cooling water is withdrawn.

Supplier means an entity, other than the regulated facility, that owns and operates its own cooling water intake structure and directly withdraws water from waters of the United States. The supplier sells the cooling water to other facilities for their use, but may also use a portion of the water itself. An entity that provides potable water to residential populations (*e.g.*, public water system) is not a supplier for purposes of this subpart.

Thermocline means the middle layer of a thermally stratified lake or a reservoir. In this layer, there is a rapid change in temperatures between the top and bottom of the layer.

Tidal river means the most seaward reach of a river or stream where the salinity is typically less than or equal to 0.5 parts per thousand (by mass) at a time of annual low flow and whose surface elevation responds to the effects of coastal lunar tides.

§ 125.94 How will requirements reflecting best technology available for minimizing adverse environmental impact be established for my Phase II existing facility?

(a) *Compliance alternatives.* You must select and implement one of the following five alternatives for establishing best technology available for minimizing adverse environmental impact at your facility:

(1)(i)You may demonstrate to the Director that you have reduced, or will reduce, your flow commensurate with a closed-cycle recirculating system. In this case, you are deemed to have met the applicable performance standards and will not be required to demonstrate further that your facility meets the impingement mortality and entrainment performance standards specified in paragraph (b) of this section. In addition, you are not subject to the requirements in § 125.95, 125.96, 125.97, or 125.98. However, you may still be subject to any more stringent requirements established under paragraph (e) of this section; or

(ii) You may demonstrate to the Director that you have reduced, or will reduce, your maximum through-screen design intake velocity to 0.5 ft/s or less. In this case, you are deemed to have met the impingement mortality performance standards and will not be required to demonstrate further that your facility meets the performance standards for impingement mortality specified in paragraph (b) of this section and you are not subject to the requirements in § 125.95, 125.96, 125.97, or 125.98 as they apply to impingement mortality. However, you are still subject to any applicable requirements for entrainment reduction and may still be subject to any more stringent requirements established under paragraph (e) of this section.

(2) You may demonstrate to the Director that your existing design and construction technologies, operational measures, and/or restoration measures meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section.

(3) You may demonstrate to the Director that you have selected, and will install and properly operate and maintain, design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section;

(4) You may demonstrate to the Director that you have installed, or will install, and properly operate and maintain an approved design and construction technology in accordance with § 125.99(a) or (b); or

(5) You may demonstrate to the Director that you have selected, installed, and are properly operating and maintaining, or will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures that the Director has determined to be the best technology available to minimize adverse environmental impact for your facility in accordance with paragraphs (a)(5)(i) or (ii) of this section.

(i) If the Director determines that data specific to your facility demonstrate that the costs of compliance under alternatives in paragraphs (a)(2) through (4) of this section would be significantly greater than the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards in paragraph (b) of this section, the Director must make a site-specific determination of the best technology available for minimizing adverse environmental impact. This determination must be based on

reliable, scientifically valid cost and performance data submitted by you and any other information that the Director deems appropriate. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that is, in the judgment of the Director, as close as practicable to the applicable performance standards in paragraph (b) of this section, without resulting in costs that are significantly greater than the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards. The Director's site-specific determination may conclude that design and construction technologies, operational measures, and/or restoration measures in addition to those already in place are not justified because of the significantly greater costs. To calculate the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards you must:

(A) Determine which technology the Administrator modeled as the most appropriate compliance technology for your facility;

(B) Using the Administrator's costing equations, calculate the annualized capital and net operation and maintenance (O&M) costs for a facility with your design intake flow using this technology;

(C) Determine the annualized net revenue loss associated with net construction downtime that the Administrator modeled for your facility to install this technology;

(D) Determine the annualized pilot study costs that the Administrator modeled for your facility to test and optimize this technology;

(E) Sum the cost items in paragraphs (a)(5)(i)(B), (C), and (D) of this section; and **[*41686]**

(F) Determine if the performance standards that form the basis of these estimates (*i.e.*, impingement mortality reduction only or impingement mortality and entrainment reduction) are applicable to your facility, and if necessary, adjust the estimates to correspond to the applicable performance standards.

(ii) If the Director determines that data specific to your facility demonstrate that the costs of compliance under alternatives in paragraphs (a)(2) through (4) of this section would be significantly greater than the benefits of complying with the applicable performance standards at your facility, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact. This determination must be based on reliable, scientifically valid cost and performance data submitted by you and any other information the Director deems appropriate. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that, in the judgment of the Director, is as close as practicable to the applicable performance standards in paragraph (b) of this section without resulting in costs that are significantly greater than the benefits at your facility. The Director's site-specific determination may conclude that design and construction technologies, operational measures,

and/or restoration measures in addition to those already in place are not justified because the costs would be significantly greater than the benefits at your facility.

(b) *National performance standards.*—(1) *Impingement mortality performance standards.* If you choose compliance alternatives in paragraphs (a)(2), (a)(3), or (a)(4) of this section, you must reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline.

(2) *Entrainment performance standards.* If you choose compliance alternatives in paragraphs (a)(1)(ii), (a)(2), (a)(3), or (a)(4) of this section, you must also reduce entrainment of all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline if:

(i) Your facility has a capacity utilization rate of 15 percent or greater, and

(ii)(A) Your facility uses cooling water withdrawn from a tidal river, estuary, ocean, or one of the Great Lakes; or

(B) Your facility uses cooling water withdrawn from a freshwater river or stream and the design intake flow of your cooling water intake structures is greater than five percent of the mean annual flow.

(3) *Additional performance standards for facilities withdrawing from a lake (other than one of the Great Lakes) or a reservoir.* If your facility withdraws cooling water from a lake (other than one of the Great Lakes) or a reservoir and you propose to increase the design intake flow of cooling water intake structures it uses, your increased design

intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water, except in cases where the disruption does not adversely affect the management of fisheries. In determining whether any such disruption does not adversely affect the management of fisheries, you must consult with Federal, State, or Tribal fish and wildlife management agencies).

(4) *Use of performance standards for site-specific determinations of best technology available.* The performance standards in paragraphs (b)(1) through (3) of this section must also be used for determining eligibility for site-specific determinations of best technology available for minimizing adverse environmental impact and establishing site specific requirements that achieve an efficacy as close as practicable to the applicable performance standards without resulting in costs that are significantly greater than those considered by the Administrator for a facility like yours in establishing the performance standards or costs that are significantly greater than the benefits at your facility, pursuant to § 125.94(a)(5).

(c) *Requirements for restoration measures.* With the approval of the Director, you may implement and adaptively manage restoration measures that produce and result in increases of fish and shellfish in your facility's watershed in place of or as a supplement to installing design and control technologies and/or adopting operational measures that reduce impingement mortality and entrainment. You must demonstrate to the Director that:

(1) You have evaluated the use of design and construction technologies and operational measures

for your facility and determined that the use of restoration measures is appropriate because meeting the applicable performance standards or site-specific requirements through the use of design and construction technologies and/or operational measures alone is less feasible, less cost-effective, or less environmentally desirable than meeting the standards or requirements in whole or in part through the use of restoration measures; and

(2) The restoration measures you will implement, alone or in combination with design and construction technologies and/or operational measures, will produce ecological benefits (fish and shellfish), including maintenance or protection of community structure and function in your facility's waterbody or watershed, at a level that is substantially similar to the level you would achieve by meeting the applicable performance standards under paragraph (b) of this section, or that satisfies alternative site-specific requirements established pursuant to paragraph (a)(5) of this section.

(d)(1) *Compliance using a technology installation and operation plan or restoration plan.* If you choose one of the compliance alternatives in paragraphs (a)(2), (3), (4), or (5) of this section, you may request that compliance with the requirements of § 125.94(b) during the first permit containing requirements consistent with this subpart be determined based on whether you have complied with the construction, operational, maintenance, monitoring, and adaptive management requirements of a Technology Installation and Operation Plan developed in accordance with § 125.95(b)(4)(ii) (for any design and construction technologies and/or operational

measures) and/or a Restoration Plan developed in accordance with § 125.95(b)(5) (for any restoration measures). The Technology Installation and Operation Plan must be designed to meet applicable performance standards in paragraph (b) of this section or alternative site-specific requirements developed pursuant to paragraph (a)(5) of this section. The Restoration Plan must be designed to achieve compliance with the applicable requirements in paragraph (c) of this section.

(2) During subsequent permit terms, if you selected and installed design and construction technologies and/or operational measures and have been in compliance with the construction, operational, maintenance, monitoring, and adaptive management requirements of your Technology Installation and Operation Plan during the preceding permit term, you may request that compliance with the requirements of § 125.94 during the following permit term be determined based on whether you remain in compliance with your Technology Installation and Operation Plan, revised in accordance with your adaptive management plan in if applicable performance standards are not being **[*41687]** met. Each request and approval of a Technology Installation and Operation Plan shall be limited to one permit term.

(3) During subsequent permit terms, if you selected and installed restoration measures and have been in compliance with the construction, operational, maintenance, monitoring, and adaptive management requirements in your Restoration Plan during the preceding permit term, you may request that compliance with the requirements of this section

during the following permit term be determined based on whether you remain in compliance with your Restoration Plan, revised in accordance with your adaptive management plan in § 125.95(b)(5)(v) if applicable performance standards are not being met. Each request and approval of a Restoration Plan shall be limited to one permit term.

(e) *More stringent standards.* The Director may establish more stringent requirements as best technology available for minimizing adverse environmental impact if the Director determines that your compliance with the applicable requirements of this section would not meet the requirements of applicable State and Tribal law, or other Federal law.

(f) *Nuclear facilities.* If you demonstrate to the Director based on consultation with the Nuclear Regulatory Commission that compliance with this subpart would result in a conflict with a safety requirement established by the Commission, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Nuclear Regulatory Commission's safety requirement.

§ 125.95 As an owner or operator of a Phase II existing facility, what must I collect and submit when I apply for my reissued NPDES permit?

(a)(1) You must submit to the Director the Proposal for Information Collection required in paragraph (b)(1) of this section prior to the start of information collection activities;

(2) You must submit to the Director the information required in § 122.21(r)(2), (r)(3) and (r)(5) and any applicable portions of the Comprehensive Demonstration Study (Study), except for the Proposal for Information Collection required by paragraph (b)(1) of this section; and

(i) You must submit your NPDES permit application in accordance with the time frames specified in 40 CFR 122.21(d)(2).

(ii) If your existing permit expires before [Insert date 4 years after date of publication in the FR], you may request that the Director establish a schedule for you to submit the information required by this section as expeditiously as practicable, but not later than [Insert date 3 years and 180 days after date of publication in the FR]. Between the time your existing permit expires and the time an NPDES permit containing requirements consistent with this subpart is issued to your facility, the best technology available to minimize adverse environmental impact will continue to be determined based on the Director's best professional judgment.

(3) In subsequent permit terms, the Director may approve a request to reduce the information required to be submitted in your permit application on the cooling water intake structure(s) and the source waterbody, if conditions at your facility and in the waterbody remain substantially unchanged since your previous application. You must submit your request for reduced cooling water intake structure and waterbody application information to the Director at least one year prior to the expiration of the permit. Your request must identify each required information item in § 122.21(r) and this

section that you determine has not substantially changed since the previous permit application and the basis for your determination.

(b) *Comprehensive Demonstration Study.* The purpose of the Comprehensive Demonstration Study (The Study) is to characterize impingement mortality and entrainment, to describe the operation of your cooling water intake structures, and to confirm that the technologies, operational measures, and/or restoration measures you have selected and installed, or will install, at your facility meet the applicable requirements of § 125.94. All facilities except those that have met the applicable requirements in accordance with § 125.94(a)(1)(i), 125.94(a)(1)(ii), and 125.94(a)(4) must submit all applicable portions of the Comprehensive Demonstration Study to the Director in accordance with paragraph (a) of this section. Facilities that meet the requirements in § 125.94(a)(1)(i) by reducing their flow commensurate with a closed-cycle, recirculating system are not required to submit a Comprehensive Demonstration Study. Facilities that meet the requirements in § 125.94(a)(1)(ii) by reducing their design intake velocity to 0.5 ft/sec or less are required to submit a Study only for the entrainment requirements, if applicable. Facilities that meet the requirements in § 125.94(a)(4) and have installed and properly operate and maintain an approved design and construction technology (in accordance with § 125.99) are required to submit only the Technology Installation and Operation Plan in paragraph (b)(4) of this section and the Verification Monitoring Plan in paragraph (b)(7) of this section. Facilities that are required to meet only impingement mortality performance standards in

§ 125.94(b)(1) are required to submit only a Study for the impingement mortality reduction requirements. The Comprehensive Demonstration Study must include:

(1) *Proposal For Information Collection.* You must submit to the Director for review and comment a description of the information you will use to support your Study. The Proposal for Information must be submitted prior to the start of information collection activities, but you may initiate such activities prior to receiving comment from the Director. The proposal must include:

(i) A description of the proposed and/or implemented technologies, operational measures, and/or restoration measures to be evaluated in the Study;

(ii) A list and description of any historical studies characterizing impingement mortality and entrainment and/or the physical and biological conditions in the vicinity of the cooling water intake structures and their relevance to this proposed Study. If you propose to use existing data, you must demonstrate the extent to which the data are representative of current conditions and that the data were collected using appropriate quality assurance/quality control procedures;

(iii) A summary of any past or ongoing consultations with appropriate Federal, State, and Tribal fish and wildlife agencies that are relevant to this Study and a copy of written comments received as a result of such consultations; and

(iv) A sampling plan for any new field studies you propose to conduct in order to ensure that you have

sufficient data to develop a scientifically valid estimate of impingement mortality and entrainment at your site. The sampling plan must document all methods and quality assurance/quality control procedures for sampling and data analysis. The sampling and data analysis methods you propose must be appropriate for a quantitative survey and include consideration of the methods used in other studies performed in the source waterbody. The sampling plan must include a description of the study area (including the area of influence of the cooling water intake structure(s)), and provide a **[*41688]** taxonomic identification of the sampled or evaluated biological assemblages (including all life stages of fish and shellfish).

(2) *Source waterbody flow information.* You must submit to the Director the following source waterbody flow information:

(i) If your cooling water intake structure is located in a freshwater river or stream, you must provide the annual mean flow of the waterbody and any supporting documentation and engineering calculations to support your analysis of whether your design intake flow is greater than five percent of the mean annual flow of the river or stream for purposes of determining applicable performance standards under paragraph (b) of this section. Representative historical data (from a period of time up to 10 years, if available) must be used; and

(ii) If your cooling water intake structure is located in a lake (other than one of the Great Lakes) or a reservoir and you propose to increase its design intake flow, you must provide a description of the thermal stratification in the waterbody, and any

supporting documentation and engineering calculations to show that the total design intake flow after the increase will not disrupt the natural thermal stratification and turnover pattern in a way that adversely impacts fisheries, including the results of any consultations with Federal, State, or Tribal fish and wildlife management agencies.

(3) *Impingement Mortality and/or Entrainment Characterization Study.* You must submit to the Director an Impingement Mortality and/or Entrainment Characterization Study whose purpose is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment. The Impingement Mortality and/or Entrainment Characterization Study must include the following, in sufficient detail to support development of the other elements of the Comprehensive Demonstration Study:

(i) Taxonomic identifications of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

(ii) A characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) identified pursuant to paragraph (b)(3)(i) of this section, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s), based on sufficient data to

characterize annual, seasonal, and diel variations in impingement mortality and entrainment (*e.g.*, related to climate and weather differences, spawning, feeding and water column migration). These may include historical data that are representative of the current operation of your facility and of biological conditions at the site;

(iii) Documentation of the current impingement mortality and entrainment of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) identified pursuant to paragraph (b)(3)(i) of this section and an estimate of impingement mortality and entrainment to be used as the calculation baseline. The documentation may include historical data that are representative of the current operation of your facility and of biological conditions at the site. Impingement mortality and entrainment samples to support the calculations required in paragraphs (b)(4)(i)(C) and (b)(5)(iii) of this section must be collected during periods of representative operational flows for the cooling water intake structure and the flows associated with the samples must be documented;

(4) *Technology and compliance assessment information*—(i) Design and Construction Technology Plan. If you choose to use design and construction technologies and/or operational measures, in whole or in part to meet the requirements of § 125.94(a)(2) or (3), you must submit a Design and Construction Technology Plan to the Director for review and approval. In the plan, you must provide the capacity utilization rate for your facility (or for individual intake structures

where applicable, in accordance with § 125.93) and provide supporting data (including the average annual net generation of the facility (in MWh) measured over a five year period (if available) of representative operating conditions and the total net capacity of the facility (in MW)) and underlying calculations. The plan must explain the technologies and/or operational measures you have in place and/or have selected to meet the requirements in § 125.94. (Examples of potentially appropriate technologies may include, but are not limited to, wedgewire screens, fine mesh screens, fish handling and return systems, barrier nets, aquatic filter barrier systems, vertical and/or lateral relocation of the cooling water intake structure, and enlargement of the cooling water intake structure opening to reduce velocity. Examples of potentially appropriate operational measures may include, but are not limited to, seasonal shutdowns, reductions in flow, and continuous or more frequent rotation of traveling screens.) The plan must contain the following information:

(A) A narrative description of the design and operation of all design and construction technologies and/or operational measures (existing and proposed), including fish handling and return systems, that you have in place or will use to meet the requirements to reduce impingement mortality of those species expected to be most susceptible to impingement, and information that demonstrates the efficacy of the technologies and/or operational measures for those species;

(B) A narrative description of the design and operation of all design and construction technologies

and/or operational measures (existing and proposed) that you have in place or will use to meet the requirements to reduce entrainment of those species expected to be the most susceptible to entrainment, if applicable, and information that demonstrates the efficacy of the technologies and/or operational measures for those species;

(C) Calculations of the reduction in impingement mortality and entrainment of all life stages of fish and shellfish that would be achieved by the technologies and/or operational measures you have selected based on the Impingement Mortality and/or Entrainment Characterization Study in paragraph (b)(3) of this section. In determining compliance with any requirements to reduce impingement mortality or entrainment, you must assess the total reduction in impingement mortality and entrainment against the calculation baseline determined in accordance with paragraph (b)(3) of this section. Reductions in impingement mortality and entrainment from this calculation baseline as a result of any design and construction technologies and/or operational measures already implemented at your facility should be added to the reductions expected to be achieved by any additional design and/or construction technologies and operational measures that will be implemented, and any increases in fish and shellfish within the waterbody attributable to your restoration measures. Facilities that recirculate a portion of their flow, but do not reduce **[*41689]** flow sufficiently to satisfy the compliance option in may take into account the reduction in impingement mortality and entrainment associated with the reduction in flow when determining the net reduction associated with

existing design and construction technologies and/or operational measures. This estimate must include a site-specific evaluation of the suitability of the technologies and/or operational measures based on the species that are found at the site, and may be determined based on representative studies (*i.e.*, studies that have been conducted at a similar facility's cooling water intake structures located in the same waterbody type with similar biological characteristics) and/or site-specific technology prototype or pilot studies; and

(D) Design and engineering calculations, drawings, and estimates prepared by a qualified professional to support the descriptions required by paragraphs (b)(4)(i)(A) and (B) of this section.

(ii) Technology Installation and Operation Plan. If you choose the compliance alternative in § 125.94(a)(2), (3), (4), or (5) and use design and construction technologies and/or operational measures in whole or in part to comply with the applicable requirements of § 125.94, you must submit the following information with your application for review and approval by the Director:

(A) A schedule for the installation and maintenance of any new design and construction technologies. Any downtime of generating units to accommodate installation and/or maintenance of these technologies should be scheduled to coincide with otherwise necessary downtime (*e.g.*, for repair, overhaul, or routine maintenance of the generating units) to the extent practicable. Where additional downtime is required, you may coordinate scheduling of this downtime with the North American Electric Reliability Council and/or other generators in your

area to ensure that impacts to reliability and supply are minimized;

(B) List of operational and other parameters to be monitored, and the location and frequency that you will monitor them;

(C) List of activities you will undertake to ensure to the degree practicable the efficacy of installed design and construction technologies and operational measures, and your schedule for implementing them;

(D) A schedule and methodology for assessing the efficacy of any installed design and construction technologies and operational measures in meeting applicable performance standards or site-specific requirements, including an adaptive management plan for revising design and construction technologies, operational measures, operation and maintenance requirements, and/or monitoring requirements if your assessment indicates that applicable performance standards or site-specific requirements are not being met; and

(E) If you choose the compliance alternative in § 125.94(a)(4), documentation that the appropriate site conditions in § 125.99(a) or (b) exist at your facility.

(5) *Restoration Plan.* If you propose to use restoration measures, in whole or in part, to meet the applicable requirements in § 125.94, you must submit the following information with your application for review and approval by the Director. You must address species of concern identified in consultation with Federal, State, and Tribal fish and wildlife management agencies with responsibility for

fisheries and wildlife potentially affected by your cooling water intake structure(s).

(i) A demonstration to the Director that you have evaluated the use of design and construction technologies and/or operational measures for your facility and an explanation of how you determined that restoration would be more feasible, cost-effective, or environmentally desirable;

(ii) A narrative description of the design and operation of all restoration measures (existing and proposed) that you have in place or will use to produce fish and shellfish;

(iii) Quantification of the ecological benefits of the proposed restoration measures. You must use information from the Impingement Mortality and/or Entrainment Characterization Study required in paragraph (b)(3) of this section, and any other available and appropriate information, to estimate the reduction in fish and shellfish impingement mortality and/or entrainment that would be necessary for your facility to comply with § 125.94(c)(2). You must then calculate the production of fish and shellfish that you will achieve with the restoration measures you will or have already installed. You must include a discussion of the nature and magnitude of uncertainty associated with the performance of these restoration measures. You must also include a discussion of the time frame within which these ecological benefits are expected to accrue;

(iv) Design calculations, drawings, and estimates to document that your proposed restoration measures in combination with design and

construction technologies and/or operational measures, or alone, will meet the requirements of § 125.94(c)(2). If the restoration measures address the same fish and shellfish species identified in the Impingement Mortality and/or Entrainment Characterization Study (in-kind restoration), you must demonstrate that the restoration measures will produce a level of these fish and shellfish substantially similar to that which would result from meeting applicable performance standards in § 125.94(b), or that they will satisfy site-specific requirements established pursuant to § 125.94(a)(5). If the restoration measures address fish and shellfish species different from those identified in the Impingement Mortality and/or Entrainment Characterization Study (out-of-kind restoration), you must demonstrate that the restoration measures produce ecological benefits substantially similar to or greater than those that would be realized through in-kind restoration. Such a demonstration should be based on a watershed approach to restoration planning and consider applicable multi-agency watershed restoration plans, site-specific peer-reviewed ecological studies, and/or consultation with appropriate Federal, State, and Tribal fish and wildlife management agencies.

(v) A plan utilizing an adaptive management method for implementing, maintaining, and demonstrating the efficacy of the restoration measures you have selected and for determining the extent to which the restoration measures, or the restoration measures in combination with design and construction technologies and operational measures, have met the applicable requirements of § 125.94(c)(2). The plan must include:

(A) A monitoring plan that includes a list of the restoration parameters that will be monitored, the frequency at which you will monitor them, and success criteria for each parameter;

(B) A list of activities you will undertake to ensure the efficacy of the restoration measures, a description of the linkages between these activities and the items in paragraph (b)(5)(v)(A) of this section, and an implementation schedule; and

(C) A process for revising the Restoration Plan as new information, including monitoring data, becomes available, if the applicable requirements under § 125.9(c)(2) are not being met.

(vi) A summary of any past or ongoing consultation with appropriate Federal, State, and Tribal fish and wildlife management agencies on your use of restoration measures including a copy of **[*41690]** any written comments received as a result of such consultations;

(vii) If requested by the Director, a peer review of the items you submit for the Restoration Plan. You must choose the peer reviewers in consultation with the Director who may consult with EPA and Federal, State, and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by your cooling water intake structure(s). Peer reviewers must have appropriate qualifications (*e.g.*, in the fields of geology, engineering, and/or biology, etc.) depending upon the materials to be reviewed; and

(viii) A description of the information to be included in a bi-annual status report to the Director.

(6) *Information to support site-specific determination of best technology available for minimizing adverse environmental impact.* If you have requested a site-specific determination of best technology available for minimizing adverse environmental impact pursuant to § 125.94(a)(5)(i) because of costs significantly greater than those considered by the Administrator for a facility like yours in establishing the applicable performance standards of § 125.94(b), you are required to provide to the Director the information specified in paragraphs (b)(6)(i) and (b)(6)(iii) of this section. If you have requested a site-specific determination of best technology available for minimizing adverse environmental impact pursuant to § 125.94(a)(5)(ii) because of costs significantly greater than the benefits of meeting the applicable performance standards of § 125.94(b) at your facility, you must provide the information specified in paragraphs (b)(6)(i), (b)(6)(ii), and (b)(6)(iii) of this section:

(i) *Comprehensive Cost Evaluation Study.* You must perform and submit the results of a Comprehensive Cost Evaluation Study, that includes:

(A) Engineering cost estimates in sufficient detail to document the costs of implementing design and construction technologies, operational measures, and/or restoration measures at your facility that would be needed to meet the applicable performance standards of § 125.94(b);

(B) A demonstration that the costs documented in paragraph (b)(6)(i)(A) of this section significantly exceed either those considered by the Administrator for a facility like yours in establishing the applicable

performance standards or the benefits of meeting the applicable performance standards at your facility; and

(C) Engineering cost estimates in sufficient detail to document the costs of implementing the design and construction technologies, operational measures, and/or restoration measures in your Site-Specific Technology Plan developed in accordance with paragraph (b)(6)(iii) of this section.

(ii) *Benefits Valuation Study.* If you are seeking a site-specific determination of best technology available for minimizing adverse environmental impact because of costs significantly greater than the benefits of meeting the applicable performance standards of § 125.94(b) at your facility, you must use a comprehensive methodology to fully value the impacts of impingement mortality and entrainment at your site and the benefits achievable by meeting the applicable performance standards. In addition to the valuation estimates, the benefit study must include the following:

(A) A description of the methodology(ies) used to value commercial, recreational, and ecological benefits (including any non-use benefits, if applicable);

(B) Documentation of the basis for any assumptions and quantitative estimates. If you plan to use an entrainment survival rate other than zero, you must submit a determination of entrainment survival at your facility based on a study approved by the Director;

(C) An analysis of the effects of significant sources of uncertainty on the results of the study; and

(D) If requested by the Director, a peer review of the items you submit in the Benefits Valuation Study. You must choose the peer reviewers in consultation with the Director who may consult with EPA and Federal, State, and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by your cooling water intake structure. Peer reviewers must have appropriate qualifications depending upon the materials to be reviewed.

(E) A narrative description of any non-monetized benefits that would be realized at your site if you were to meet the applicable performance standards and a qualitative assessment of their magnitude and significance.

(iii) *Site-Specific Technology Plan.* Based on the results of the Comprehensive Cost Evaluation Study required by paragraph (b)(6)(i) of this section, and the Benefits Valuation Study required by paragraph (b)(6)(ii) of this section, if applicable, you must submit a Site-Specific Technology Plan to the Director for review and approval. The plan must contain the following information:

(A) A narrative description of the design and operation of all existing and proposed design and construction technologies, operational measures, and/or restoration measures that you have selected in accordance with § 125.94(a)(5);

(B) An engineering estimate of the efficacy of the proposed and/or implemented design and construction technologies or operational measures, and/or restoration measures. This estimate must include a site-specific evaluation of the suitability of

the technologies or operational measures for reducing impingement mortality and/or entrainment (as applicable) of all life stages of fish and shellfish based on representative studies (*e.g.*, studies that have been conducted at cooling water intake structures located in the same waterbody type with similar biological characteristics) and, if applicable, site-specific technology prototype or pilot studies. If restoration measures will be used, you must provide a Restoration Plan that includes the elements described in paragraph (b)(5) of this section.

(C) A demonstration that the proposed and/or implemented design and construction technologies, operational measures, and/or restoration measures achieve an efficacy that is as close as practicable to the applicable performance standards of § 125.94(b) without resulting in costs significantly greater than either the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards, or as appropriate, the benefits of complying with the applicable performance standards at your facility;

(D) Design and engineering calculations, drawings, and estimates prepared by a qualified professional to support the elements of the Plan.

(7) *Verification Monitoring Plan.* If you comply using compliance alternatives in § 125.94(a)(2), (3), (4), or (5) using design and construction technologies and/or operational measures, you must submit a plan to conduct, at a minimum, two years of monitoring to verify the full-scale performance of the proposed or already implemented technologies and/or operational measures. The verification study must begin once the design and construction technologies and/or

operational measures are installed and continue for a period of time that is sufficient to demonstrate to the Director whether the facility is meeting the applicable performance standards in § 125.94(b) or site-specific requirements **[*41691]** developed pursuant to § 125.95(a)(5). The plan must provide the following:

(i) Description of the frequency and duration of monitoring, the parameters to be monitored, and the basis for determining the parameters and the frequency and duration for monitoring. The parameters selected and duration and frequency of monitoring must be consistent with any methodology for assessing success in meeting applicable performance standards in your Technology Installation and Operation Plan as required by paragraph (b)(4)(ii) of this section.

(ii) A proposal on how naturally moribund fish and shellfish that enter the cooling water intake structure would be identified and taken into account in assessing success in meeting the performance standards in § 125.94(b).

(iii)A description of the information to be included in a bi-annual status report to the Director.

§ 125.96 As an owner or operator of a Phase II existing facility, what monitoring must I perform?

As an owner or operator of a Phase II existing facility, you must perform monitoring, as applicable, in accordance with the Technology Installation and Operation Plan required by § 125.95(b)(4)(ii), the Restoration Plan required by § 125.95(b)(5), the Verification Monitoring Plan required by

§ 125.95(b)(7), and any additional monitoring specified by the Director to demonstrate compliance with the applicable requirements of § 125.94.

§ 125.97 As an owner or operator of a Phase II existing facility, what records must I keep and what information must I report?

As an owner or operator of a Phase II existing facility you are required to keep records and report information and data to the Director as follows:

(a) You must keep records of all the data used to complete the permit application and show compliance with the requirements of § 125.94, any supplemental information developed under § 125.95, and any compliance monitoring data submitted under § 125.96, for a period of at least three (3) years from date of permit issuance. The Director may require that these records be kept for a longer period.

(b) You must submit a status report to the Director for review every two years that includes appropriate monitoring data and other information as specified by the Director in accordance with § 125.98(b)(5).

§ 125.98 As the Director, what must I do to comply with the requirements of this subpart?

(a) Permit application. As the Director, you must review materials submitted by the applicant under 40 CFR 122.21(r) and § 125.95 before each permit renewal or reissuance.

(1) You must review and comment on the Proposal for Information Collection submitted by the facility in accordance with § 125.95(a)(1). You are encouraged to provide comments expeditiously so that the permit applicant can make responsive

modifications to its information gathering activities. If a facility submits a request in accordance with § 125.95(a)(2)(ii) for an alternate schedule for submitting the information required in § 125.95, you must approve a schedule that is as expeditious as practicable, but does not extend beyond January 7, 2008. If a facility submits a request in accordance with § 125.95(a)(3) to reduce the information about their cooling water intake structures and the source waterbody required to be submitted in their permit application (other than with the first permit application after September 7, 2004), you must approve the request within 60 days if conditions at the facility and in the waterbody remain substantially unchanged since the previous application.

(2) After receiving the permit application from the owner or operator of a Phase II existing facility, you must determine which of the requirements specified in § 125.94 apply to the facility. In addition, you must review materials to determine compliance with the applicable requirements.

(3) At each permit renewal, you must review the application materials and monitoring data to determine whether new or revised requirements for design and construction technologies, operational measures, or restoration measures should be included in the permit to meet the applicable performance standards in § 125.94(b) or alternative site-specific requirements established pursuant to § 125.95(a)(5).

(b) *Permitting requirements.* Section 316(b) requirements are implemented for a facility through

an NPDES permit. As the Director, you must consider the information submitted by the Phase II existing facility in its permit application, and determine the appropriate requirements and conditions to include in the permit based on the compliance alternatives in § 125.94(a). The following requirements must be included in each permit:

(1) *Cooling water intake structure requirements.* The permit conditions must include the requirements that implement the applicable provisions of § 125.94. You must evaluate the performance of the design and construction technologies, operational measures, and/or restoration measures proposed and implemented by the facility and require additional or different design and construction technologies, operational measure, and/or restoration measures, and/or improved operation and maintenance of existing technologies and measures, if needed to meet the applicable performance standards, restoration requirements, or alternative site-specific requirements. In determining compliance with the performance standards for facilities proposing to increase withdrawals of cooling water from a lake (other than a Great Lake) or a reservoir in § 125.94(b)(3), you must consider anthropogenic factors (those not considered "natural") unrelated to the Phase II existing facility's cooling water intake structures that can influence the occurrence and location of a thermocline. These include source water inflows, other water withdrawals, managed water uses, wastewater discharges, and flow/level management practices (*e.g.*, some reservoirs release water from deeper bottom layers). As the Director, you must coordinate with appropriate Federal, State, or Tribal

fish and wildlife management agencies to determine if any disruption of the natural thermal stratification resulting from the proposed increased withdrawal of cooling water does not adversely affect the management of fisheries. Specifically:

(i) You must review and approve the Design and Construction Technology Plan required in § 125.95(b)(4) to evaluate the suitability and feasibility of the design and construction technology and/or operational measures proposed to meet the performance standards in § 125.94(b) or site-specific requirements developed pursuant to § 125.94(a)(5).

(ii) If the facility proposes restoration measures in accordance with § 125.94(c) , you must review and approve the Restoration Plan required under § 125.95(b)(5) to determine whether the proposed measures, alone or in combination with design and construction technologies and/or operational measures, will meet the requirements under § 125.94(c).

(iii) In each reissued permit, you must include a condition in the permit requiring the facility to reduce impingement mortality and entrainment (or to increase fish production, if applicable) commensurate with the efficacy at the facility of the installed design and construction technologies, **[*41692]** operational measures, and/or restoration measures.

(iv) If the facility implements design and construction technologies and/or operational measures and requests that compliance with the requirements in § 125.94 be measured for the first permit term (or subsequent permit terms, if

applicable) employing the Technology Installation and Operation Plan in accordance with § 125.95(b)(4)(ii), you must review the Technology Installation and Operation Plan to ensure it meets the requirements of § 125.95(b)(4)(ii). If the Technology Installation and Operation Plan meets the requirements of § 125.95(b)(4)(ii), you must approve the Technology Installation and Operation Plan and require the facility to meet the terms of the plan including any revision to the plan that may be necessary if applicable performance standards or alternative site-specific requirements are not being met. If the facility implements restoration measures and requests that compliance with the requirements in § 125.94 be measured for the first permit term (or subsequent permit terms, if applicable) employing a Restoration Plan in accordance with § 125.95(b)(5), you must review the Restoration Plan to ensure it meets the requirements of § 125.95(b)(5). If the Restoration Plan meets the requirements of § 125.95(b)(5), you must approve the plan and require the facility to meet the terms of the plan including any revision to the plan that may be necessary if applicable performance standards or site-specific requirements are not being met. In determining whether to approve a Technology Installation and Operation Plan or Restoration Plan, you must evaluate whether the design and construction technologies, operational measures, and/or restoration measures the facility has installed, or proposes to install, can reasonably be expected to meet the applicable performance standards in § 125.94(b), restoration requirements in § 125.94(c)(2), and/or alternative site-specific requirements established pursuant to § 125.94(a)(5),

and whether the Technology Installation and Operation Plan and/or Restoration Plan complies with the applicable requirements of § 125.95(b). In reviewing the Technology Installation and Operation Plan, you must approve any reasonable scheduling provisions that are designed to ensure that impacts to energy reliability and supply are minimized, in accordance with § 125.94(b)(4)(ii)(A). If the facility does not request that compliance with the requirements in § 125.94 be measured employing a Technology Installation and Operation Plan and/or Restoration Plan, or the facility has not been in compliance with the terms of its current Technology Installation and Operation Plan and/or Restoration Plan during the preceding permit term, you must require the facility to comply with the applicable performance standards in § 125.94(b), restoration requirement in § 125.94(c)(2), and/or alternative site-specific requirements developed pursuant to § 125.94(a)(5). In considering a permit application, you must review the performance of the design and construction technologies, operational measures, and/or restoration measures implemented and require additional or different design and construction technologies, operational measures, and/or restoration measures, and/or improved operation and maintenance of existing technologies and measures, if needed to meet the applicable performance standards, restoration requirements, and/or alternative site-specific requirements.

(v) You must review and approve the proposed Verification Monitoring Plan submitted under § 125.95(b)(7) (for design and construction technologies) and/or monitoring provisions of the Restoration Plan submitted under § 125.95(b)(5)(v)

and require that the monitoring continue for a sufficient period of time to demonstrate whether the design and construction technology, operational measures, and/or restoration measures meet the applicable performance standards in § 125.94(b), restoration requirements in 125.94(c)(2) and/or site-specific requirements established pursuant to § 125.94(a)(5).

(vi) If a facility requests requirements based on a site-specific determination of best technology available for minimizing adverse environmental impact, you must review the application materials submitted under § 125.95(b)(6) and any other information you may have, including quantitative and qualitative benefits, that would be relevant to a determination of whether alternative requirements are appropriate for the facility. If a facility submits a study to support entrainment survival at the facility, you must review and approve the results of that study. If you determine that alternative requirements are appropriate, you must make a site-specific determination of best technology available for minimizing adverse environmental impact in accordance with § 125.94(a)(5). You, as the Director, may request revisions to the information submitted by the facility in accordance with § 125.95(b)(6) if it does not provide an adequate basis for you to make this determination. Any alternative site-specific requirements established based on new and/or existing design and construction technologies, operational measures, and/or restoration measures, must achieve an efficacy that is, in your judgement, as close as practicable to the applicable performance standards of § 125.94(b) without resulting in costs that are significantly greater than the costs

considered by the Administrator for a like facility in establishing the applicable performance standards in § 125.94(b), determined in accordance with § 125.94(a)(5)(i)(A) through (F), or the benefits of complying with the applicable performance standards at the facility; and

(vii) You must review the proposed methods for assessing success in meeting applicable performance standards and/or restoration requirements submitted by the facility under § 125.95(b)(4)(ii)(D) and/or (b)(5)(v)(A), evaluate those and other available methods, and specify how assessment of success in meeting the performance standards and/or restoration requirements must be determined including the averaging period for determining the percent reduction in impingement mortality and entrainment and/or the production of fish and shellfish. Compliance for facilities who request that compliance be measured employing a Technology Installation and Operation Plan and/or Restoration Plan must be determined in accordance with § 125.98(b)(1)(iv).

(2) *Monitoring conditions.* You must require the facility to perform monitoring in accordance with the Technology Installation and Operation Plan in § 125.95(b)(4)(ii), the Restoration Plan required by § 125.95(b)(5), if applicable, and the Verification Monitoring Plan required by § 125.95(b)(7). In determining any additional applicable monitoring requirements in accordance with § 125.96, you must consider the monitoring facility's Verification Monitoring, Technology Installation and Operation, and/or Restoration Plans, as appropriate. You may modify the monitoring program based on changes in

physical or biological conditions in the vicinity of the cooling water intake structure.

(3) *Recordkeeping and reporting.* At a minimum, the permit must require the facility to report and keep records specified in § 125.97.

(4) *Design and construction technology approval*— (i) For a facility that chooses to demonstrate that it has installed and properly operate and maintain a design and construction technology approved in accordance with § 125.99, the Director must review **[*41693]** and approve the information submitted in the Technology Installation and Operation Plan in § 125.95(b)(4)(ii) and determine if it meets the criteria in § 125.99.

(ii) If a person requests approval of a technology under § 125.99(b), the Director must review and approve the information submitted and determine its suitability for widespread use at facilities with similar site conditions in its jurisdiction with minimal study. As the Director, you must evaluate the adequacy of the technology when installed in accordance with the required design criteria and site conditions to consistently meet the performance standards in § 125.94. You, as the Director, may only approve a technology following public notice and consideration of comment regarding such approval.

(5) *Bi-annual status report.* You must specify monitoring data and other information to be included in a status report every two years. The other information may include operation and maintenance records, summaries of adaptive management activities, or any other information that is relevant to determining compliance with the terms of the

facility's Technology Operation and Installation Plan and/or Restoration Plan.

§ 125.99 What are approved design and construction technologies?

(a) The following technologies constitute approved design and construction technologies for purposes of § 125.94(a)(4):

(1) Submerged cylindrical wedge-wire screen technology, if you meet the following conditions:

(i) Your cooling water intake structure is located in a freshwater river or stream;

(ii) Your cooling water intake structure is situated such that sufficient ambient counter currents exist to promote cleaning of the screen face;

(iii)Your maximum through-screen design intake velocity is 0.5 ft/s or less;

(iv) The slot size is appropriate for the size of eggs, larvae, and juveniles of all fish and shellfish to be protected at the site; and

(v) Your entire main condenser cooling water flow is directed through the technology. Small flows totaling less than 2 MGD for auxiliary plant cooling uses are excluded from this provision.

(2) A technology that has been approved in accordance with the process described in paragraph (b) of this section.

(b) You or any other interested person may submit a request to the Director that a technology be approved in accordance with the compliance alternative in § 125.94(a)(4) after providing the public with notice and an opportunity to comment on

the request for approval of the technology. If the Director approves the technology, it may be used by all facilities with similar site conditions under the Director's jurisdiction. Requests for approval of a technology must be submitted to the Director and include the following information:

(1) A detailed description of the technology;

(2) A list of design criteria for the technology and site characteristics and conditions that each facility must have in order to ensure that the technology can consistently meet the appropriate impingement mortality and entrainment performance standards in § 125.94(b); and

(3) Information and data sufficient to demonstrate that facilities under the jurisdiction of the Director can meet the applicable impingement mortality and entrainment performance standards in § 125.94(b) if the applicable design criteria and site characteristics and conditions are present at the facility.

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OPPOSITION BRIEF

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SUPREME COURT, U.S.

Nos. 07-588, 07-589 & 07-597

In The

Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL.,
Respondents.

UTILITY WATER ACT GROUP,
Petitioner,

v.

RIVERKEEPER, INC., ET AL.,
Respondents.

On Petitions for Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF FOR RIVERKEEPER, INC., ET AL. IN OPPOSITION

P. KENT CORRELL
300 PARK AVENUE
17TH FLOOR
NEW YORK, NY 10022
(212) 475-3070

REED W. SUPER
Counsel of Record
LAW OFFICE OF REED W. SUPER
116 JOHN STREET, SUITE 3100
NEW YORK, NY 10038
(212) 791-1881

Counsel for Respondents Riverkeeper, Inc., et al.
February 29, 2008

Becker Gallagher · Cincinnati, OH · Washington, D.C. · 800.890.5001

COUNTER STATEMENT OF QUESTIONS PRESENTED

1. Whether the court of appeals properly remanded the Environmental Protection Agency's Phase II cooling water intake structure regulations for further rulemaking because of uncertainty as to whether EPA based its determination of "best technology available" ("BTA") on cost-benefit analysis rather than on economic availability, cost-effectiveness, or other considerations permissible under the plain language of Clean Water Act section 316(b). (07-588 Q3; 07-589 Q1; 07-597 Q1)

2. Whether the court of appeals correctly followed its Phase I decision and remanded a provision in EPA's Phase II cooling water intake structure regulations that would have allowed compliance with section 316(b) through "restoration measures." (07-589 Q2; 07-597 Q2)

3. Whether section 316(b) of the Clean Water Act applies to both new and existing facilities, as its plain language makes clear and as the courts and EPA have consistently recognized since the statutory provision was enacted in 1972. (07-588 Qs1&2)

CORPORATE DISCLOSURE STATEMENT

Respondents Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay—People for Narragansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, and Surfrider Foundation have no parent corporations, and no publicly owned company owns stock in them.

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COUNTER STATEMENT OF THE CASE

In language not repeated elsewhere in the Act or in any other federal statute, section 316(b) of the Clean Water Act ("CWA") provides that "[a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available ['BTA'] for minimizing adverse environmental impact." 33 U.S.C § 1326(b). Section 316(b) is the only provision in the statute that regulates water *withdrawals*, as opposed to *discharges*. In this case, which presents questions of first impression concerning the application of this unique statutory language to a novel Environmental Protection Agency (EPA) rulemaking, the Second Circuit unanimously remanded EPA's rule for further explanation and possible revision. *Riverkeeper, Inc. v. EPA* ("*Riverkeeper II*"), 475 F.3d 83 (2d Cir. 2007); App. 1a-86a.[1] Significantly, EPA has not sought review by this Court and is reconsidering its rule on remand. Only industry parties have filed petitions for certiorari.

The petitions should be denied for three reasons. First, the further administrative proceedings on remand make review premature, and petitioners' exaggerated claims about the purportedly devastating impact of the court's ruling ignore the indisputable fact that the effect of that ruling has yet to be determined. Second, there are no circuit splits. Third, the court's decision is correct on the merits, and there is no

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[1] Citations to "App." refer to petitioner PSEG's appendix.

compelling reason for this Court to review the court of appeals' fact-specific application of this unique statutory language to EPA's rulemaking.

Cooling Water Intake Structures

Section 316(b) directs EPA to regulate cooling water intake structures, through which power plants and other heavy industrial facilities withdraw cooling water from natural waterbodies. Such structures "kill or injure billions of aquatic organisms every year" by trapping (or "impinging") them against grills or screens or drawing them into the cooling system ("entraining" them). *Riverkeeper II*, App. 2a; *see also Riverkeeper, Inc. v. EPA* (*"Riverkeeper I"*), 358 F.3d 174, 181 (2d Cir. 2004) ("A single power plant might impinge a million adult fish in just a three-week period, or entrain some 3 to 4 billion smaller fish and shellfish in a year, destabilizing wildlife populations in the surrounding ecosystem."). Intake structures affect the full spectrum of aquatic organisms, from plankton to sea turtles, including threatened and endangered species. 69 Fed. Reg. 41,575, 41,586-87 (July 9, 2004).

Available technology can dramatically reduce this environmental damage. Some plants are "dry-cooled" by air instead of water, and many others employ "closed-cycle" water cooling systems that reduce withdrawals and aquatic mortality by 70 to 96 percent compared to the relatively primitive "once-through" cooling systems used by older plants. Virtually all gas-fired power plants and two-thirds of coal-fired plants built in the last 25 years use closed-cycle cooling. 66 Fed. Reg. 28,853, 28,856 (May 25, 2001); *see also* NEI *Amicus* Br. 16 (about 40 percent of nuclear plants are closed-cycle). Other technologies, such as fine-mesh

screens, barrier nets, and fish diversion or return systems, are designed to exclude organisms from intakes or return them to waterways.

EPA Rulemaking under Section 316(b)

The 1976 Regulations. In 1976, EPA promulgated section 316(b) regulations,[2] but the regulations were remanded by the Fourth Circuit because of a notice-and-comment violation, *Appalachian Power Co. v. Train*, 566 F.2d 451, 457 (4th Cir. 1977), and withdrawn. 44 Fed. Reg. 32,853, 32,956 (June 7, 1979). EPA issued no new section 316(b) regulations in the 1980s or 1990s. Absent regulations, permits for intake structures were issued during that time by EPA and state agencies on a case-by-case, "best professional judgment" basis.

Between 1995 and 2002, EPA agreed to a series of consent decrees requiring it to conduct rulemaking under section 316(b), and ultimately decided to pursue the rulemaking in three phases: (1) Phase I (new facilities); (2) Phase II (large existing power plants); and (3) Phase III (small existing power plants and all other existing facilities). App. 4a-5a.

Phase I. In 2001, EPA promulgated its Phase I Rule covering cooling water intake structures at new facilities. 66 Fed. Reg. 65,255 (Dec. 18, 2001). The Phase I Rule requires larger new facilities to use

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[2] At that time, EPA refused to determine BTA based on cost-benefit analysis, explaining that "[t]he statute directs the Agency to ... select the most effective means of minimizing (i.e., 'reducing to the smallest possible amount or degree') th[e] adverse effects." 41 Fed. Reg. 17,387, 17,388 (Apr. 26, 1976).

cooling water intakes that withdraw no more water than a closed-cycle system. 40 C.F.R. § 125.84(b)(1). The Phase I Rule also includes a second compliance track under which a facility can escape limits on intake flows if it uses other technologies that achieve comparable reductions of adverse environmental impacts, *see* 40 C.F.R. §§ 125.84(d)(1), 125.86(c)(2), and a "variance" provision if compliance at a particular facility would be excessively costly or have adverse impacts on air or water quality or energy markets. 40 C.F.R. § 125.85. In addition, the Phase I Rule would have allowed compliance solely through habitat "restoration measures" designed to offset the adverse impact of cooling water withdrawals. 66 Fed. Reg. at 65,280-81. Like the remanded 1976 regulations, the Phase I requirements were *not* based on cost-benefit analysis. Instead, EPA "selected best technology available for minimizing adverse environmental impact on the basis of what it determined to be an economically practicable cost for the industry as a whole." 66 Fed. Reg. at 65,309. EPA gave three reasons, including "cost-effectiveness," for rejecting standards based on dry cooling. 66 Fed. Reg. at 65,282-84.

In consolidated challenges by environmentalists and industry, the Second Circuit upheld most of the Phase I Rule, *Riverkeeper I,* 358 F.3d at 181, but remanded the "restoration measures" provision "as plainly inconsistent with the statute's text" because they did not involve the "location, design, construction, and capacity" of intake structures, *id.* at 189, and did not meet the statutory requirement of "minimizing the adverse environmental impact" of those structures. *Id.*

at 190. No party sought certiorari, and the *Riverkeeper I* decision is final.

Phase II. In 2004, EPA promulgated the Phase II Rule at issue here, applicable to large existing power plants. 69 Fed. Reg. 41,575 (July 9, 2004), codified at 40 C.F.R. § 125.90 *et seq*. The Phase II Rule set performance standards requiring a 60-90 percent reduction in entrainment and a 80-95 percent reduction in impingement, to be achieved through any technologies. 40 C.F.R. § 125.94(b). EPA based these standards on a suite of technologies.

The Phase II Rule included alternative compliance options allowing facilities to elect a less stringent determination of BTA based on either cost-cost analysis (comparison of a facility's costs to those considered by EPA) or *cost-benefit* analysis. 40 C.F.R. § 125.94(a)(5)(i), (ii). Like the Phase I Rule, the Phase II Rule also allowed compliance through "restoration measures." 40 C.F.R. § 125.94(c).

The Phase II Rule rejected stricter requirements based on closed-cycle cooling. One alternative EPA considered but rejected was a flow limit commensurate with closed-cycle cooling for 51 facilities – less than ten percent of the facilities covered by the rule – with extremely large withdrawals from waterbodies containing essential habitat and nursery areas. 67 Fed. Reg. 17,121, 17,155-58 (Apr. 9, 2002).

Both environmentalists and industry challenged the Phase II Rule in consolidated petitions. In the unanimous decision below, the Second Circuit rejected Entergy's claim that section 316(b) applies only to new facilities and remanded eight aspects of the rule to

EPA for further rulemaking because it found they were "inadequately explained or inconsistent with the statute, or because the EPA failed to give adequate notice of its rulemaking." App. 3a.

In the holding to which petitioners primarily object, the court of appeals stated: "If the EPA construed the statute to permit cost-benefit analysis, its action was not 'based on a permissible construction of the statute.'" *Id.* at 33a (quoting *Chevron U.S.A., Inc. v. Natural Res. Def. Council,* 467 U.S. 837, 843 (1984)). Significantly, the court of appeals did *not* construe section 316(b) as barring cost considerations entirely. Rather, it held that the "statutory language suggests that the EPA may consider costs in determining BTA, in that a technology that cannot not be reasonably borne by the industry is not 'available' in any meaningful sense," but that "cost-benefit analysis is not similarly supported by the language or purpose of the statute." *Id.* at 21a. The court further explained that, in determining BTA, EPA must "first determine what is the most effective technology" and "whether the industry as a whole can reasonably bear the cost of the adoption of the technology," *id.* at 23a, and that "EPA may then consider other factors, including cost-effectiveness, to choose a less expensive technology that achieves essentially the same results as the benchmark." *Id.* at 23a-24a. Finally, the court explained that EPA "may also depart from this performance benchmark because of other permissible considerations aside from cost, for instance, energy efficiency or environmental impact." *Id.* at 24a n.12 (citing *Riverkeeper I*, 358 F.3d at 195-96).

Notably, the court's ruling concerning the appropriate role of costs under section 316(b) did not lead it to reject EPA's BTA determination definitively. Although the court said that cost-benefit analysis "appears to have played some role" in EPA's BTA determination, *id.* at 29a, the court found it "*unclear* whether the Agency improperly weighed the benefits and the costs." *Id.* (emphasis added); *see also id.* at 32a ("[I]t is *impossible to tell* whether the EPA based its decision on permissible cost-effectiveness analysis or exceeded its authority by relying impermissibly upon a cost-benefit analysis.") (emphasis added). As a result, the court concluded that "[i]t may also be that the EPA misunderstood or misapplied cost-effectiveness analysis" or "may have simply failed either to perform the required analysis or to explain adequately a decision that was within its authority to make." *Id.* at 33a. Accordingly, the court "remand[ed] to the EPA the provision establishing BTA so that it may provide either a reasoned explanation of its decision or a new determination of BTA based on permissible considerations." *Id.* at 85a. Importantly, the court required only "clarification of the basis for the Agency's action and *possibly* ... a new determination of BTA." *Id.* at 33a (emphasis added). The court also remanded several other provisions that were based on the same considerations as, or closely interrelated with, the BTA determination.

With respect to restoration measures, the court followed its decision in *Riverkeeper I* in finding that, by allowing compliance through restoration measures, EPA had impermissibly construed section 316(b). *Id.* at 85a.

Finally, the court rejected Entergy's claim that section 316(b) applies only to new facilities, *id.* at 65a-70a, holding that the plain language of section 316(b), and in particular its reference to section 301, which applies to existing point sources, indicates that the section applies to existing facilities, and that even if the language were ambiguous, EPA's reasonable and longstanding interpretation of it as applying to existing facilities was entitled to *Chevron* deference.

EPA did not seek rehearing, and petitioners' rehearing requests were denied with no judge voting for rehearing. App. 88a-89a. Upon remand, the agency suspended virtually the entire Phase II Rule, 72 Fed. Reg. 37,107 (July 9, 2007), and commenced further rulemaking proceedings. Until EPA promulgates a new final Phase II Rule, "[p]ermit requirements for cooling water intake structures at Phase II facilities should be established on a case-by-case best professional judgment (BPJ) basis." *Id.* at 37,108. EPA's suspension of the rule thus restored the *status quo ante* with respect to permitting of power plant cooling water intakes that has been in effect for 35 years.

Phase III. In 2006, EPA promulgated Phase III regulations, applicable to new offshore oil rigs, that were not based on cost-benefit analysis. 71 Fed. Reg. 35,005 (June 16, 2006). Simultaneously, EPA decided, on the basis of an explicit cost-benefit analysis, *not* to promulgate section 316(b) regulations for existing manufacturing facilities. *Id.* at 35,016-17. In consolidated petitions pending before the United States Court of Appeals for the Fifth Circuit, industry contends that EPA should have conducted a cost-

benefit analysis, while the environmental petitioners challenge EPA's explicit reliance on cost-benefit analysis. *ConocoPhillips Co., et al. v. EPA*, 5th Cir. Dkt. No. 06-606[illegible] 2 (and consolidated cases). Thus, the Fifth Circuit is currently considering "precisely the same issue" the Second Circuit decided below – whether EPA has authority to rely on cost-benefit considerations under section 316(b). UWAG Pet. 18; *see also* PSEG Pet. 13-14.

REASONS FOR DENYING THE PETITIONS

The decision below involves issues of statutory interpretation whose impact on the regulation at issue remains undetermined because of the court's remand to EPA for clarification of the basis of its decision. Moreover, the Second Circuit's conclusions that section 316(b) applies to existing facilities and that Congress intended EPA to implement that section without engaging in cost-benefit analysis or allowing compliance through "restoration" measures reflect application of standard principles of statutory construction to unique statutory language, applied to a single regulation, and do not conflict with decisions of any other court of appeals. Should a conflict eventually arise, there will be ample opportunity for this Court to address it either in the Phase III case that is still pending or in further judicial review proceedings once EPA completes its reconsideration of the Phase II Rule. Meanwhile, particularly in light of the correctness of each of the Second Circuit's rulings, review by this Court is not warranted.

I. THERE IS NO VALID REASON FOR REVIEW NOW, WHILE REMAND PROCEEDINGS ARE PENDING

The Second Circuit's decision remanded the Phase II Rule for further explanation and *possible* revision in light of the court's opinion. The court noted that "EPA in reconsidering its selection of BTA on remand may alter the suite of technologies it originally selected," App. 34a, but the court did not say such alteration was required, much less foreordain the exact features of a properly explained and justified rule.

EPA has not sought review of the court's ruling,[3] but instead has suspended the Phase II Rule almost entirely "while the Agency considers how to address the remanded issues." 72 Fed. Reg. at 37,108. As directed by the remand, EPA is reconsidering the core provisions of the Phase II Rule, including the BTA determination, the establishment of requirements reflecting BTA, and the various options for complying with or obtaining variances from those requirements. Whatever the result of its reevaluation, EPA must notice a new proposed Phase II Rule in the Federal Register for public comment and then, after considering and responding to those comments, issue a new Phase II Rule. Only when the regulatory process is complete will the practical impact of the Second Circuit's ruling become clear. Moreover, because major parts of the rule were also remanded on

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[3] Although we have no way of knowing what EPA may say in response to the petitions, we note that the non-extendable time in which EPA may file a response *supporting* the petitions under this Court's Rule 12.6 has long since passed.

grounds as to which petitioners have *not* sought this Court's review, further rulemaking would be required *even if* this Court were to grant the petitions and then agree with petitioners that EPA's BTA determination was proper. Thus, no action by this Court would reinstate the Phase II Rule as promulgated.

When it does promulgate a new Phase II Rule, EPA may change its BTA determination substantially, modestly, or not at all. Another round of judicial review is virtually inevitable, but whether it will be the industry petitioners or environmental groups that are aggrieved by how EPA carries out the remand remains to be seen. In any event, any further review will be based on a complete record, following proper notice and comment. The Second Circuit will then determine whether EPA's reexamination of its actions is consistent with section 316(b), supported by the record, and not arbitrary and capricious. In the event that, at the end of the day, the industry petitioners are dissatisfied by some feature of the final rule that is attributable to one of the aspects of the Second Circuit's holding that they now challenge, the petitioners could seek review of the issue by this Court at that time. The effectively interlocutory posture of the proceedings below thus counsels strongly against granting the petitions.

Meanwhile, the parade of economic and energy-related horribles petitioners and *amici* conjure up to justify review is, at this point, completely unfounded. Their forecasts of exorbitant compliance costs, facility closures, and grid failure are all premised on the hypothetical presupposition that EPA will promulgate a new rule that compels substantially all 550 Phase II

facilities to retrofit to closed-cycle cooling. *See* PSEG Pet. 32-36, UWAG Pet. 36-39. But petitioners themselves concede that the decision below does *not* mandate such a result. *See, e.g.*, UWAG Pet. 37 ("UWAG does not believe that retrofitting closed-cycle cooling can be justified even after *Riverkeeper II*...").

Indeed, petitioners and *amici* admit that their true concern is not with the decision itself, but with what they consider to be the "implication[s] of the Second Circuit's opinion," PSEG Pet. 33, or what they predict EPA or others will contend those implications are. *See, e.g.*, NEI *Amicus* Br. 9 (respondents "will no doubt argue that the court's reasoning requires that result"); *see also id.* at 2 ("court's reasoning may require the EPA to mandate" retrofits). But until the administrative process is complete, predictions about what EPA *may* do, or what others may *argue* it should do, do not justify this Court's intervention.[4]

Moreover, although predicting what EPA might ultimately include in a revised Phase II Rule is speculative, the BTA option EPA rejected on the basis of what appeared to the court of appeals to include improper considerations would *not* have established a flow limit based on closed-cycle cooling for all facilities, but *only* for the 51 largest plants (less than ten percent of those covered by the rule) located "on sensitive waterbodies." *Riverkeeper II* App. 29a; 67 Fed. Reg. at

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[4] If any permits are issued on a case-by-case basis while EPA is reconsidering the rule, permittees and other interested parties will have ample opportunities to challenge any permit provisions they consider to be improperly based on the "implications" of the Second Circuit's opinion.

17,156-58. EPA concluded that adverse economic and environmental effects of this alternative would be minimal and compliance costs low. *Id.*

Further, that EPA may base its BTA determination on a particular technology does not mean that all facilities will necessarily install that technology and incur the associated costs. For example, the Phase I Rule included both a second compliance track and a variance provision applicable if compliance would impose excessive costs or involve other adverse impacts. 40 C.F.R. §§ 125.84(d)(1), 125.86(c)(2), 125.85. Both alternative compliance provisions were upheld by the Second Circuit. *Riverkeeper I*, 358 F.3d at 187-89, 192-94.

PSEG's claim that the decision below "blithely accepts the bankruptcy or closure of numerous electricity generating facilities, *without considering impacts to the U.S. electric supply*," PSEG Pet. 34 (emphasis added), and numerous other similar claims regarding the court's alleged indifference to economic and technological burdens, facility closures, or energy impacts, are simply incorrect. As in *Riverkeeper I*, in the decision below the court recognized that a technology is not "available" unless its costs can be reasonably borne by the industry. *Riverkeeper II*, App. 21a; *Riverkeeper I*, 358 F.3d at 195. Cost-effectiveness may also be considered. *Riverkeeper II*, App. 23a. Moreover, the Second Circuit stated that other "permissible considerations" include "energy efficiency and production concerns." *Riverkeeper II*, App. 24a n.12 (citing *Riverkeeper I*, 358 F.3d at 195-96). Accordingly, EPA will, no doubt, consider economics, facility closures, and any energy impacts on remand,

and if the agency does not do so to petitioners' liking, they will surely challenge its decision once it is final.

Similarly unwarranted are the assertions by petitioners and *amici* that the decision below "will significantly affect our Nation's environmental priorities" by increasing fossil fuel consumption with its associated air pollution and greenhouse gases. *See, e.g.*, PSEG Pet. 32, 35; UWAG Pet. 38-39; NEI *Amicus* Br. 18-20. As petitioner UWAG admits, the decision below "acknowledges EPA's right to consider" such environmental effects. UWAG Pet. at 39. Again, EPA will doubtlessly consider them on remand, and if it does not, petitioners will surely challenge the revised rule on that basis.

Also unavailing are petitioners' claims of absurd results, such as the expenditure of billions of dollars to save "a single fish larvae." Entergy Pet. 3, 4; *see also* CWISC *Amicus* at 6 ("one additional fish"). To the contrary, the Phase II Rule applies only to facilities withdrawing large volumes of water, at least 50 million gallons per day, and, as EPA found, these large power plants kill aquatic organisms in enormous numbers. *See supra* at 2. Unless and until the course of actual rulemaking substantiates petitioners' purported fear that the agency will require extreme measures to save a single fish, their hyperbole provides no basis for review.

In short, even if petitioners' legal positions were arguably meritorious, which they are not, now is not the time for the Court to address them, particularly in light of the federal government's determination not to seek certiorari despite EPA's strong disagreement with aspects of the Second Circuit's ruling.

II. THERE IS NO CIRCUIT SPLIT

There are no conflicts among the circuits over the issues decided by the court of appeals. The absence of conflict is hardly surprising because section 316(b) is a singular provision rarely before construed, in part because of EPA's lengthy failure to promulgate cooling water intake standards. Indeed, until the Second Circuit's 2004 decision in *Riverkeeper I*, no court ever had occasion to review the substance of a section 316(b) regulation. Although Congress enacted section 316(b) in 1972, the only regulations EPA issued under that section – before its current, three-part rulemaking – were the 1976 regulations remanded by the Fourth Circuit on purely procedural grounds. *Appalachian Power Co. v. Train*, 566 F.2d 451, 457 (4th Cir. 1977). Only two other court of appeals decisions have construed section 316(b), both in the 1970s and in the context of permits issued by EPA on a case-by-case basis in the absence of national regulations. *U.S. Steel Corp. v. Train*, 556 F.2d 822 (7th Cir. 1977); *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306 (1st Cir. 1979).

Riverkeeper II is perfectly consistent with the very limited section 316(b) authority that preceded it – *Riverkeeper I* and the two 1970s permitting cases. There is no reason to abandon this Court's usual practice of awaiting a conflict among the circuits before accepting review. As petitioners themselves note, in reviewing EPA's Phase III rule the Fifth Circuit is currently considering "precisely the same issue" that the Second Circuit decided below as to whether EPA may rely on cost-benefit considerations under section 316(b). UWAG Pet. 18. If the Fifth

Circuit disagrees with the Second, and a conflict does materialize, there will be ample opportunity for EPA, petitioners, or any party aggrieved by either circuit's decision to seek this Court's review. Not only could Riverkeeper or the other environmental petitioners in the Phase III case file a petition for a writ of certiorari to the Fifth Circuit, but, in addition, once the Second Circuit reviews the revised Phase II Rule that EPA will issue on remand, any aggrieved parties could file a new petition for certiorari (assuming they were in fact injured by features of the revised rule attributable to the court's holding that the statute does not permit cost-benefit analysis). Review now, before a conflict has arisen, is unwarranted and unnecessary.

A. Cost Considerations

1. The decision below does not conflict with the First Circuit's 1979 decision in *Seacoast*. There, in approving a permit for New Hampshire's Seabrook power plant, the court did *not* hold that EPA may base section 316(b) determinations on cost-benefit considerations. 597 F.2d at 311. Indeed, in the single paragraph of the opinion that discussed costs, that court did not even consider that issue, nor was it asked to. Rather, noting that petitioners' challenge was "not a model of clarity" and understanding them only to "suggest that cost of delay is an improper consideration," the First Circuit denied their claim (without deciding whether considering such costs would be improper) because it was based on a misreading of the record. *Id.* ("Apparently petitioners read the cost figure ... as including the estimated costs of delay and reengineering as well as additional

tunnelling. ... The record is clear, however, that $20 million is the cost of the tunnelling alone.").

The First Circuit explicitly stated that the *Seacoast* petitioners "d[id] *not* argue that the cost may not be considered." *Id.* (emphasis added). The court's observation that "cost" – not cost-benefit analysis – "[is] an acceptable consideration in determining whether the intake design 'reflect(s) the best technology available,'" *id.*, is fully consistent with *Riverkeeper I* and *Riverkeeper II,* which found both economic availability and cost-effectiveness to be proper considerations. Indeed, we readily acknowledge that consideration of compliance costs (as opposed to cost-benefit analysis) is proper under section 316(b).

To be sure, the First Circuit also noted that the EPA "Administrator decided that moving the intake further offshore might further minimize the entrainment of some plankton, but only slightly, and that the costs would be 'wholly disproportionate to any environmental benefit.'" *Id.* But that decision was apparently based on *cost-effectiveness* (because the two intake locations had essentially the same benefit), rather than cost-benefit. *See Riverkeeper II*, App. 20a-21a (comparing the two types of analyses). Certainly, nothing in the First Circuit's opinion addresses the distinction drawn below between cost-effectiveness and cost-benefit analysis, let alone sets forth a *holding* on the point that conflicts with the Second Circuit's. Thus, contrary to PSEG's argument, it is not at all "clear [that] the First Circuit would have decided this case differently." PSEG at 25.

2. Nor are there any other conflicting appellate decisions.[5] PSEG's speculation that "the Sixth and D.C. Circuits ... would have decided this case differently," PSEG Pet. 21, is unfounded because those circuits have never construed section 316(b). The host of cases PSEG and the other petitioners cite construed the language of *other* sections of the Clean Water Act, such as sections 301, 304 and 306, or other environmental laws entirely. *See* PSEG Pet. 19-21; UWAG Pet. 27-28; Entergy Pet. 31-33. Thus, none of them is, or could be, in direct conflict because the heart of this case is section 316(b)'s distinctive text.

As petitioners themselves recognize, section 316(b)'s standard is "unique," PSEG Pet. 11; *see also* Entergy Pet. 4, and, as the Second Circuit has explained, "cooling water intake structures are *suorum generum*." *Riverkeeper I*, 358 F.3d at 186. That the court of appeals looked for "guidance" to other courts' interpretations of other CWA provisions, and observed that they support its construction of 316(b), does not

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[5] This Court need not consider UWAG's citation to a single sentence of *dicta* from *United States Steel v. Train*, 556 F.2d 822 (7th Cir. 1977), UWAG Pet. 21, because UWAG itself concedes there is no actual conflict with the Seventh Circuit on this point. *See id.* at 19 (arguing that First Circuit is "only other circuit that has decided the § 316(b) issue presented here"). In fact, *U.S. Steel* rejected, as premature, the argument that EPA must do a cost-benefit analysis, and it is unclear from the *dicta* UWAG cites to what extent that court's expectation of how EPA would take costs into account would differ from the cost-effectiveness analysis that the Second Circuit's decision permits. 556 F.2d at 850.

establish a conflict.[6] Thus, there is no merit to petitioners' and *amici*'s claims that the decision below should be reviewed because it "may also sweep far broader than §316(b)" and affect other CWA provisions or other laws, or "invite[ ] a rash of challenges to NPDES permits." PSEG Pet. 36; *see also* Entergy Pet. 31; CWISC *Amicus* Br. 16-17. In short, the Second Circuit interpreted only section 316(b) and did not purport to issue holdings concerning any other statutes.

PSEG's claim that "until this case, no court has ever held that EPA is *prohibited* from considering costs in relation to benefits," PSEG Pet. 20, merely reflects the fact that, before appearing to do so in promulgating its Phase II Rule, EPA never relied on cost-benefit analysis in promulgating BTA standards for

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[6] Petitioners' attempt to manufacture a conflict is also based on their incorrect suggestion that EPA may rely on cost-benefit analysis in establishing effluent limitations based on "best available technology" ("BAT") under sections 301 and 304. Their argument is irreconcilable with the language of the statute, 33 U.S.C. §§ 1311(b)(2)(A), 1314(b)(2)(B), and with *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64 (1980), which recognized that "in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits." *Id.* at 71. Petitioners also mischaracterize *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011 (D.C. Cir. 1978) and *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784 (6th Cir. 1995). In neither case had EPA used cost-benefit analysis to establish BAT, and thus neither court held such analysis proper. Rather, the Sixth Circuit decision cited the earlier D.C. Circuit decision, which was discussing the 1977 "best practicable control technology," or "BPT," standards, not the 1983 BAT standards. *Id.* at 796 (citing *Weyerhaeuser*, 590 F.2d at 1045).

intake structures under section 316(b) (or, for that matter, in promulgating BAT effluent limitations under sections 301 and 304). Petitioners acknowledge, as they must, that "numerous circuits have recognized that EPA is not required to consider costs and benefits when setting BAT," PSEG Pet. 20, but fail to identify any case where EPA *did* use cost-benefit analysis to set such standards, let alone a case where such a decision was upheld in court.

Finally, PSEG's argument that the decision below is "hard to reconcile" with *Riverkeeper I* not only fails to provide a basis for granting certiorari (after all, the Second Circuit is responsible for maintaining consistency of its own precedents, and no judge of that court favored rehearing *en banc*), but also relies on the mistaken contention that EPA's rejection of dry-cooling technology in its Phase I Rule was supported by "cost-benefit considerations." PSEG Pet. 21 n.2. In fact, the preamble to the Phase I Rule makes clear that "EPA has not selected the best technology available on a cost-benefit basis," and that EPA instead based that Phase I decision on "cost-effectiveness." 66 Fed. Reg. at 65,284, 65,309. EPA's reliance on cost-effectiveness in Phase I also rebuts Entergy's assertion that the court of appeals "made up" a "novel 'cost-effectiveness' test" in *Riverkeeper II*. Entergy Pet. at 25, 11.

B. Restoration Measures

In *Riverkeeper I*, the Second Circuit remanded the Phase I Rule's "restoration measures" provision as "plainly inconsistent with the statute's text and Congress's intent in passing the 1972 amendments," 358 F.3d at 189, and no party sought this Court's review of that decision. In the decision below, a

different panel reaffirmed that holding and remanded the Phase II Rule's nearly identical provision, stating: "our holding in *Riverkeeper I* was and remains clear: restoration measures contradict the unambiguous language of section 316(b)." App. 43a. The court's straightforward application of section 316(b) to the regulations at issue does not conflict with any other decision and does not warrant this Court's review.

Other than the *Riverkeeper I* and *Riverkeeper II* decisions, no court of appeals has ever had occasion to consider the issue of restoration under section 316(b). The First Circuit's 1979 *Seacoast* decision had nothing to do with restoration measures, which were not at issue in that case. Nor was the First Circuit there asked to consider whether "adverse environmental impact" under section 316(b) should be defined with respect to fish populations, individual fish, or both. While the court generally discussed the New Hampshire power plant's effect on individual fish as well as populations, 597 F.2d at 309-11, that discussion has no bearing on how that court would have viewed restoration measures.[7] *Seacoast* thus is manifestly not in conflict. Moreover, the rest of the decisions petitioners cite did not consider section 316(b) at all, but involved completely different statutes. *See* PSEG Pet. 30-31 (citing cases under the National Environmental Policy Act, among others); UWAG Pet. 34-36 (same).

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[7] Population effects were clearly relevant in that case under CWA section 316(a), 33 U.S.C. § 1326(a), which sets forth a very different standard than section 316(b), *see Riverkeeper II*, App. 53a & n.27 (explaining that "wildlife levels" can be considered under section 316(a), not section 316(b)).

C. Existing Facilities

Entergy alone contends that section 316(b) excludes existing facilities, but fails to offer even a plausible rationale for this Court's review of that issue. No court of appeals – and, indeed, to respondents' knowledge, no federal or state tribunal or agency at any level – has *ever* concluded that section 316(b) applies only to new facilities. Five years after the CWA was enacted, the Seventh Circuit upheld a NPDES permit imposing section 316(b) requirements on an existing facility. *U.S. Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977) (holding that EPA's construction of section 316(b) "to apply to *all* point sources ... comports with its plain meaning") (emphasis added). That holding has stood for over 30 years and Entergy does not cite any decisional authority that even suggests that the law is or should be otherwise, despite EPA's consistent application of section 316(b) to existing facilities over the last 35 years.

As Entergy acknowledges, *see* Entergy Pet. 20 & n.4, *United States Steel* not only held section 316(b) applicable to existing facilities, but also expressly affirmed EPA's authority to use NPDES permits to impose section 316(b) requirements. 556 F.2d at 850. Of the two decisions Entergy contends are in conflict on that point, neither even hinted that NPDES permits could not be so used. In *Virginia Electric & Power Co. v. Costle ("VEPCO")*, 566 F.2d 446 (4th Cir. 1977), the Fourth Circuit held only that original jurisdiction to review EPA's section 316(b) regulations lies in the court of appeals. *Id.* at 447. The Fourth Circuit's statement that section 316(b) regulations are

"other limitations" under sections 301 and 306, 566 F.2d at 450, accords with the decision below because NPDES permits include both effluent limitations and other limitations.

The other case Entergy cites, *Natural Resources Defense Council v. EPA*, 859 F.2d 156 (D.C. Cir. 1988), had nothing to do with section 316(b). There, the court held that EPA may not use NPDES permits to implement an *entirely different statute,* the National Environmental Policy Act ("NEPA"). *Id.* at 169. The court did not imply that NPDES permits may not be conditioned on compliance with relevant requirements of the CWA itself.

Finally, Entergy's additional request that this Court grant certiorari to resolve a claimed conflict over whether *Chevron* deference should be accorded agencies' interpretation of their own jurisdiction, Entergy Pet. 22-25, does not warrant serious consideration. Entergy did not raise this issue (or even characterize EPA's determination as "jurisdictional") below[8] and cannot now raise it here. *See Clingman v. Beaver*, 544 U.S. 581, 598 (2005) ("We ordinarily do not consider claims neither raised nor decided below."). Further, the court of appeals did *not* simply defer to EPA's interpretation on this point; it based its decision on *Chevron* step one, holding "that section 316(b), on its face, applies to existing facilities" and "Congress intended the requirements of section 316(b) to apply in

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[8] *See* Brief of Petitioner Entergy Corp., July 5, 2005, at 14-35 in *Riverkeeper II*, Dkt. No, 04-6692-ag(L). Moreover, none of the other parties briefed the issue and the court of appeals did not discuss it *sua sponte*.

tandem with the effluent limitations established pursuant to sections 301 and 306." *Riverkeeper II*, App. 68a, 70a. The court's reference to *Chevron* step two was merely an alternative holding. *Id.* at 65a ("[A]t the very least, the EPA permissibly interpreted the statute..."). It is hard to imagine a case more poorly suited for review of the jurisdictional deference issue than this one, where the issue was not developed below and is not outcome-determinative.

III. THE DECISION BELOW IS CORRECT

A. Cost Considerations

Correctly employing traditional tools of statutory construction established by this Court, the Second Circuit based its conclusion that cost-benefit analysis would be inappropriate under section 316(b) on the plain meaning of the statutory text. By requiring in section 316(b) the "*best* technology *available* for *minimizing* adverse environmental impact" (emphasis added), Congress directed EPA to mandate the most protective technology feasible. The court thus recognized that section 316(b) leaves no room for weighing of costs and benefits: "the language of section 316(b) itself plainly indicates that facilities must adopt the *best* technology available and that cost-benefit analysis cannot be justified in light of Congress's directive." *Riverkeeper II*, App. 21a.

Put another way, "the statute therefore precludes cost-benefit analysis because 'Congress itself defined the basic relationship between costs and benefits.'" *Id.* at 22a (quoting *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 509, (1981)). The Second Circuit's reading of the statute to exclude cost-benefit

analysis is fully consistent with this Court's decision in *American Textile Manufacturers* excluding cost-benefit considerations under the Occupational Safety and Health Act, as well as *Whitman v. American Trucking Ass'ns*, 531 U.S. 457 (2001), where cost considerations were precluded by the "most natural of readings" of the Clean Air Act provision at issue there. *Id.* at 465.

Petitioners mistakenly criticize the Second Circuit's reliance on *American Textile*, arguing that that "every court of appeals that has addressed *American Textile*'s impact on cost-benefit analysis has held that the case is limited to whether cost-benefit analysis is *required* by statute." PSEG Pet. 26 (citing cases); *see also* UWAG Pet. 24-25; Entergy Pet. 33-34. On the contrary, the Fifth Circuit has recognized that the "rather broad holding" of that case "*rejected any implication of cost-benefit analysis.*" *Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 355 n.36 (5th Cir. 1981) (emphasis added). As this Court observed in *American Textile*, imposing a cost-benefit criterion onto a statute meant to be governed by feasibility would be "inconsistent" with the balance struck by Congress and "would eviscerate" the congressional scheme. 452 U.S. at 509, 513.[9]

The court of appeals was also correct to attach significance to Congress's failure to authorize cost-benefit analysis expressly in section 316(b), in contrast

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[9] Entergy disparages *American Textile* as a "pre-*Chevron* decision." Entergy Pet. 12. In fact, *American Textile* is a textbook example of what later came to be called step one of *Chevron*; it employed traditional tools of statutory analysis to discern the intent of Congress.

to other environmental statutes – and, in particular, other sections of the CWA – that explicitly call for cost-benefit balancing.[10] Because Congress has repeatedly demonstrated that it knows how to authorize cost-benefit considerations when it so chooses, the absence of any such authority in section 316(b) is evidence that it did not intend such considerations to govern here. "When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute." *Am. Textile*, 452 U.S. at 510; *see also Whitman*, 531 U.S. at 467 ("We have therefore refused to find implicit in ambiguous sections of the CAA an authorization to consider costs that has elsewhere, and so often, been expressly granted.").

In giving weight to Congress's conspicuous failure to authorize cost-benefit analysis in section 316(b), the Second Circuit did not, as PSEG asserts, hand down a "new clear statement rule barring cost-benefit analysis whenever a statute is silent on the issue." PSEG Pet. 36. Rather, the court merely quoted this Court's own observation in *American Textile* about the significance of Congress's failure to authorize cost-benefit analysis explicitly. *See Riverkeeper II*, App. 22a-23a (quoting *Am. Textile*, 452 F.3d at 510). A lower court's quotation from one of this Court's decisions provides no basis for review by the Court.

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[10] *See, e.g.*, 33 U.S.C. §§ 1312(b)(2)(A), 1314(b)(1)(B), 1314(b)(4)(B). Other statutes expressly authorizing cost-benefit analysis include the Safe Drinking Water Act, 42 U.S.C. § 300g-1(b)(3)(C)(i)(IV), the fuel additive provision of the Clean Air Act, 42 U.S.C. § 7545(c)(2)(B), the Outer Continental Shelf Lands Act, 43 U.S.C. § 1347(b), and the Flood Control Act, 33 U.S.C. § 701a.

B. Restoration Measures

With respect to restoration, the court of appeals construed the specific language of section 316(b), including the statutory mandates that EPA regulate (1) the "location, design, construction, and capacity of cooling water intake structures" (2) to "minimiz[e]" their "adverse environmental impact," and found that EPA's restoration provision contradicted the statute in both respects. Off-site ecological improvement activities "have nothing to do with the location, design, construction, or capacity of cooling water intake structures."[11] App. 41a (quoting *Riverkeeper I*, 358 F.3d at 189). Moreover, attempts to "'*correct* for the adverse environmental impacts of impingement and entrainment ... do not *minimize* those impacts in the first place.'" *Id.*

The court of appeals recognized that "a rule permitting compliance with the statute through restoration measures allows facilities to avoid adopting *any* cooling water intake structure technology at all, in contravention of the Act's clear language as well as its technology-forcing principle." App. 44a; *see also Riverkeeper I*, 358 F.3d at 190 (referring to "Congress's intent that the 'design' of intake structures be

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[11] Petitioners argue that barrier nets and closed-cycle cooling systems are no more a part of the "location," "design," "construction," or "capacity" of intake structures than restoration measures. PSEG Pet. 30; UWAG Pet. 31-32. In fact, barrier nets are part of the "design" of the intake because they are placed in front of it to exclude fish. Similarly, a requirement, such as EPA's Phase I Rule, that intakes be *designed* to withdraw no more water than a closed-cycle system, clearly regulates the "design" and "capacity" of an intake structure.

regulated directly, based on the best technology available").

Petitioners argue that the word "reflect" in section 316(b) authorizes EPA to require *no* protective technology at intake structures if off-site ecological improvement activities are successful. PSEG Pet. 30. But if Congress had so intended it would not have needed to use the words "location, design, construction, and capacity of cooling water intake structures" at all. It could have simply directed EPA to ensure suitable populations of fish. Instead, consistent with the principle that technology standards regulate pollution at its source, Congress mandated best technology for four specific aspects of cooling water intake structures. Of course, "[s]tatutes must be interpreted, if possible, to give each word some operative effect." *Walters v. Metro. Educ. Enters., Inc.*, 519 U.S. 202, 209 (1997).

In addition, as the court observed in *Riverkeeper I*, "EPA's own findings reveal that restoration measures are inconsistent with Congress's intent." 358 F.3d at 190. Since at least 1977, EPA has consistently defined "adverse environmental impact" under section 316(b) to include impingement and entrainment. In the Phase II rulemaking, as in Phases I and III, EPA "interpret[ed] adverse environmental impact as the loss of aquatic organisms due to impingement and entrainment." 69 Fed. Reg at 41,612; *see also* 69 Fed. Reg. 68,443, 68,473 (Nov. 24, 2004). Restoration measures contradict EPA's determination because they do not *minimize* or even limit "how many organisms a facility entrains or impinges." 358 F.3d at 189. Restoration measures therefore cannot satisfy section

316(b)'s command to "minimize[e] adverse environmental impact."

Petitioners also vastly overstate the prior use of restoration measures by power plants. In the briefing below, industry was able to offer examples of only six of more than 500 existing power plants that had ever used restoration measures to compensate for fish kills, and none of the cited permits allowed restoration as a *complete* substitute for available intake structure technology. Instead, restoration measures have only been allowed as a *partial*, supplemental measure or under regulatory authority other than section 316(b).[12]

C. Existing Facilities

As the court of appeals recognized, "section 316(b), on its face, applies to existing facilities" and "the cross-reference in section 316(b) to section 301 provides a clear textual basis for that conclusion." *Riverkeeper II*, App. 68a-69a. Section 316(b) commands that "[a]ny standard" promulgated by EPA for point sources *under CWA section 301* "shall require" BTA for cooling water intake structures. 33 U.S.C. § 1326(b). The "standards" promulgated under section 301 are the discharge standards for *existing* point sources. *E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 121 (1977) ("Section 301(b) defines the effluent limitations that shall be achieved by *existing* point sources....") (emphasis added); *see also* Entergy Pet. 5 (Section

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[12] For example, the permitting agency clearly stated that the restoration measures undertaken by PSEG at the Salem nuclear plant, *see* PSEG Pet. 4-5, were *not* utilized to fulfill BTA requirements under section 316(b). Joint Appendix 254.

301(e) requires EPA to establish limitations applicable to "'*all* point sources' ... whether existing or new").

The court of appeals also correctly found that by applying section 316(b) to four particular aspects of cooling water intake structures – their "location, design, construction, and capacity" – Congress did not signal an intention to exclude existing facilities, as an existing facility's intake location, design, construction and capacity can be regulated just as readily as a new facility's. *Riverkeeper II*, App. 67a-68a & n.32. If Congress had wanted to limit section 316(b)'s application to new facilities, it could have done so expressly, "which would have been a simple task to do." *Id.* at 68a.

Finally, the Second Circuit properly rejected Entergy's back-up argument that CWA section 402 does not authorize EPA to use NPDES permits to impose section 316(b) requirements. Section 316(b) states that standards applicable to point sources *under sections 301 and 306* shall include BTA requirements for cooling-water intakes, and section 402(a)(1)(A), 33 U.S.C. § 1342(a)(1)(A), in turn provides that NPDES permits shall require compliance with "*all* applicable requirements under sections [301 and 306]" (emphasis added). *See Riverkeeper II*, App. 68a-69a. The statute thus provides ample authority for EPA to incorporate the BTA requirements into NPDES permits, and Entergy's contrary argument would render section 316(b) meaningless by depriving EPA of a mechanism for imposing its requirements.

CONCLUSION

The petitions for writ of certiorari should be denied.

Respectfully submitted,

P. KENT CORRELL
300 Park Avenue,
17th Floor
New York, NY 10022
(212) 475-3070

REED W. SUPER
Counsel of Record
LAW OFFICE OF REED W. SUPER
116 John Street, Suite 3100
New York, NY 10038
(212) 791-1881

Counsel for Respondents Riverkeeper, Inc., et al

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OPPOSITION BRIEF

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ENTERGY CORPORATION, *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Petitions For A Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF IN OPPOSITION FOR THE STATES OF RHODE ISLAND, CONNECTICUT, DELAWARE, NEW JERSEY, NEW YORK AND THE COMMONWEALTH OF MASSACHUSETTS

PATRICK C. LYNCH
Attorney General of Rhode Island
TRICIA O'HARE JEDELE
Special Assistant Attorney General
Counsel of Record
150 South Main Street
Providence, RI 02903
(401) 274-4400, Ext. 2400

[Additional Counsel For The States Listed On Inside Cover]

COCKLE LAW BRIEF PRINTING CO. (800) 225 6964
OR CALL COLLECT (402) 342-2831

RICHARD BLUMENTHAL
Attorney General of Connecticut
KIMBERLY MASSICOTTE
MATTHEW LEVINE
Assistant Attorneys General
P.O. Box 120
55 Elm Street
Hartford, CT 06141-0120
(860) 808-5250

JOSEPH R. BIDEN III
Attorney General of Delaware
KEVIN MALONEY
Deputy Attorney General
820 N. French Street, 6th Floor
Wilmington, DE 19801
(302) 577-8327

MARTHA COAKLEY
Attorney General of Massachusetts
ANDREW GOLDBERG
Assistant Attorney General
1 Ashburton Place, 18th Floor
Boston, MA 02108
(617) 727-2200

ANNE MILGRAM
Attorney General of New Jersey
ELLEN BARNEY BALINT
Deputy Attorney General
P.O. Box 093
25 Market Street
Trenton, NJ 08625-0093
(609) 984-5065

ANDREW M. CUOMO
Attorney General of New York
MAUREEN F. LEARY
Assistant Attorney General
THE ENVIRONMENTAL PROTECTION BUREAU
DENISE A. HARTMAN
Assistant Solicitor General
The Capitol
Albany, NY 12224
(518) 474-7154

ISSUES PRESENTED

1. Whether the Second Circuit, consistent with the opinions of other circuit courts, correctly interpreted the plain language of the Clean Water Act to preclude the use of a cost-benefit analysis as the basis for the Environmental Protection Agency's "best technology available" determination under section 316(b), and properly remanded the Phase II rule for further explanation of the cost considerations relied upon by the Environmental Protection Agency in setting the technology standards.

2. Whether the Second Circuit, consistent with the opinions of other circuit courts, correctly interpreted the plain language of the Clean Water Act to preclude the provisions of Phase II rule that allow existing power plants to comply with section 316(b) by substituting restoration measures for technology at the cooling water intake, and properly remanded the restoration provisions to the Environmental Protection Agency.

3. Whether the Second Circuit, consistent with the opinions of other circuit courts, correctly decided that the technology requirement in section 316(b) of the Clean Water Act applies to both new and existing facilities, and that those requirements may be implemented through discharge permits.

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RESPONDENT STATES' BRIEF IN OPPOSITION

The States of Rhode Island, Connecticut, Delaware, New Jersey, and New York and the Commonwealth of Massachusetts submit this brief in opposition to the certiorari petitions filed by Entergy Corporation, Utility Water Act Group ("UWAG"), and PSEG Fossil LLC and PSEG Nuclear LLC ("Industry Petitioners") seeking review of the unanimous decision of the United States Court of Appeals for the Second Circuit.[1] The Second Circuit invalidated and remanded various aspects of a rule promulgated by the United States Environmental Protection Agency ("EPA") to regulate cooling water intake structures at certain power plants under the federal Clean Water Act. The Industry Petitioners unsuccessfully sought rehearing and consideration *en banc* below. EPA did not seek rehearing in the Second Circuit and has not sought this Court's review. Instead, EPA reopened its rulemaking proceedings to address the remanded provisions identified by the Second Circuit. The States submit this brief as a consolidated opposition to the petitions.

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[1] *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007) ("*Riverkeeper II*"), App. 1a-94a (all references to "App." are to Petitioner Entergy's Appendix).

STATEMENT

Section 316(b) of the Clean Water Act

When cooling water intake structures at existing power plants withdraw significant amounts of water from associated water bodies, they impinge and entrain large quantities of fish and fish larvae. This can have severe consequences on aquatic life and ecosystems. Section 316(b) of the Clean Water Act directs EPA to establish technology requirements for these intake structures at power plants that use water to cool their electricity-generating equipment. In a single sentence, section 316(b) provides that "[a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. §1326(b), App. 112a-13a. In other words, discharge permits and other standards applicable to new and existing point sources should also control intake structures with technology-based requirements.

In 1995, EPA entered a consent decree requiring it to create regulations to implement section 316(b). The consent decree, as amended, required EPA to draft the regulations in three phases.[2] Phase I of the

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[2] *See Cronin v. Browner*, 90 F.Supp.2d 364 (S.D.N.Y. 2000); Phase I (new electricity generating facilities), 66 Fed. Reg. 65,256 (Dec. 18, 2001), codified at 40 C.F.R. Section 125.80

rulemaking, which applied to cooling water intake structures at new facilities, was challenged in the Second Circuit by environmental groups and various industry petitioners. The Second Circuit upheld most of the Phase I rule, but remanded EPA's restoration provision, which allowed power plants to use restoration measures in lieu of technology, as "plainly inconsistent with the statute's text." *Riverkeeper, Inc. v. EPA* ("*Riverkeeper I*"), 358 F.3d 174, 181, 189 (2d Cir. 2004). *Riverkeeper I* was not appealed, and, is final. *Riverkeeper II* and the pending industry petitions for certiorari concern Phase II of the EPA rulemaking. In 2006, EPA promulgated Phase III of the rule, which is not the subject of this challenge.

The Phase II rule

EPA issued its final rule pursuant to the second phase of the consent decree on July 9, 2004 ("the Phase II rule"). The Phase II rule is a unique agency rule designed to implement section 316(b), and is limited in its application to one specific activity – the intake of water at structures used at power plants

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et seq., *see Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 189-91 (2d Cir. 2004) ("*Riverkeeper I*"); Phase II (electric power plants built before 2002 that withdraw over 50 million gallons per day of cooling water), 69 Fed. Reg. 41,583, codified at 40 C.F.R. Pts. 9, 122-25, *see Riverkeeper II*; and, Phase III (existing power plants and industrial facilities not subject to Phase II), 71 Fed. Reg. 35,006 (June 16, 2006), codified at 40 C.F.R. Section 125, Subpart N, *see ConocoPhillips, et al. v. EPA*, No. 06-60662 (and consolidated cases) (5th Cir. 2006).

built before 2002 that withdraw 50 million gallons of water per day or more, of which at least twenty-five percent is used for cooling. *See Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities*, 69 Fed. Reg. 41,576 (July 9, 2004) (codified at 40 C.F.R. Pts. 9, 122-25), App. 122a-540a. *Riverkeeper II* is the first decision to address section 316(b) regulations as applied to existing facilities.

The Phase II rule identified various options for power plants to meet the statute's requirement that the plants use the "best technology available to minimize adverse environmental impacts." 33 U.S.C. §1326(b), App. 112a-13a. EPA then used these selected methods to establish performance standards keyed to required percentage reductions in fish kills associated with intake structures.[3] The Phase II rule provided existing facilities with five separate options to demonstrate compliance with the performance standards established in the rule. *See* 40 C.F.R. §125.94(a), App. 555a. While it does not require existing power plants to install closed cycle cooling systems, the Phase II rule provides that the installation of a closed cycle cooling system or one that reduces inflow commensurate with such a cooling system will be considered in compliance with the rule.

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[3] The Phase II rule establishes as a national performance standard reduction of impingement mortality for all life stages of fish and shellfish by 80 to 95 percent. Certain facilities are also required to reduce entrainment for all life stages of fish and shellfish by 60 to 90 percent.

Alternatively, facilities can comply with the rule by installing one or more of a "suite" of technologies – including fine- and wide-mesh wedgewire screens, aquatic filter barrier systems, barrier nets, and fish return systems – that meet national performance standards. Several of the compliance options allow a facility to meet the national performance standards through the use of restoration measures, such as improving the habitat surrounding the intake structure. *Riverkeeper II*, 475 F.3d at 108, App. 13a-14a.

Each of the compliance options in the rule was either based on EPA's "best technology available" determination, which was remanded, or on EPA's authorization of the use of restoration measures to meet the standard, which was rejected and remanded. While EPA addresses the Second Circuit's remand order and until it promulgates a new Phase II rule consistent with *Riverkeeper II*, none of the compliance options identified in the rule are presently operative.

The Second Circuit's Decision in *Riverkeeper II*

In *Riverkeeper II*, the States, environmental groups, and Industry Petitioners challenged various aspects of the Phase II rule. In that context, the Second Circuit's opinion addressed a number of issues. Industry Petitioners seek to raise three of those issues again here. Specifically, Industry Petitioners seek review of the Second Circuit's conclusions regarding:

(i) the cost-benefit analysis EPA used to select the "best technology available" ("BTA"); (ii) EPA's authorization of the use of restoration methods in lieu of BTA; and (iii) whether section 316(b) applies to existing facilities, and, in turn, whether it can be implemented through the Clean Water Act's pollution discharge provisions.

As to whether costs may be considered by EPA in selecting the "best technology available" for cooling water intakes, the Second Circuit did not hold that costs are irrelevant to a BTA determination. Rather, the court held that an ordinary interpretation of section 316(b) "does not permit the EPA to choose BTA on the basis of cost-benefit analysis." *Riverkeeper II*, 475 F.3d at 101, App. 29a. The Second Circuit agreed with EPA that the cross-reference to sections 301 and 306 "invites EPA to consider those sections when establishing BTA for cooling water intake systems." *Riverkeeper II,* 475 F.3d at 97, citing *Riverkeeper I*, 358 F.3d at 186, App. 20a. The court's review of section 316(b), therefore, was "informed by the two provisions it cross-references, CWA sections 301 and 306." *See Riverkeeper II*, 475 F.3d at 102, citing *Riverkeeper I*, 358 F.3d at 195, App. 20a (the court explaining that, "[s]ection 301 sets forth a framework under which limitations on the discharge of pollutants from existing sources would become more stringent over time.")

Section 301 of the Clean Water Act provides that all effluent discharge limitations established before March 31, 1989, require the application of the "best

practicable control technology currently available" ("BPT"). *See* 33 U.S.C. §1311(b)(1)(A), App. 97a. BPT determinations were to be made by the Administrator of EPA in consideration of factors referenced in section 304(b)(1)(B) of the Clean Water Act. *See* 33 U.S.C. §1314(b)(1)(B), App. 105a. In contrast, all effluent limitations established for point sources after March 31, 1989, were to apply "the best available technology economically achievable . . . , which will result in the reasonable further progress toward the national goal of eliminating the discharge of all pollutants ("BAT")." *See* 33 U.S.C. §1311(b)(2)(A), App. 98a-99a. The statute directs that BAT determinations are to be made by the Administrator of EPA in consideration of factors referenced in section 304(b)(2)(B). Section 304 identifies one set of factors to be considered for technology determinations for existing facilities pre-1989, and those factors allow for a comparison between costs and benefits. It identifies an entirely separate set of factors to be considered for technology determinations for existing facilities post-1989, and those factors conspicuously do not include the factor requiring a cost to benefit analysis, and instead list only the factor of cost. *See* 33 U.S.C. §1314(b)(2)(B), App. 106a-07a.

With this framework in mind, the court held "the EPA's interpretation of section 316(b) problematic because its construction significantly resembles the less stringent, now obsolete, BPT standard of section 301(b)(1)(A)." *Riverkeeper II*, 475 F.3d at 102, citing *Riverkeeper I*, 358 F.3d at 195, App. 30a. Ultimately,

the court rejected the cost-benefit analysis because it was precluded both by the plain language of section 316(b) and by the plain language of the cross-referenced sections. In any event, the Second Circuit could not discern EPA's basis for its BTA selection in either the language of the Phase II rule itself or the administrative record. Thus, the Second Circuit remanded the Phase II rule to EPA to clarify the role and extent that any cost-benefit analysis, or other cost considerations played in EPA's BTA determination. *Riverkeeper II*, 475 F.3d at 103, App. 33a ("it is unclear whether the Agency improperly weighed the benefits and the costs of requiring closed-cycle cooling. . . . Given the above indications that the EPA engaged in a cost-benefit analysis, we remand for the EPA to explain its conclusions.") In light of the remand, the practical significance of the Court's rejection of EPA's cost-benefit analysis, and the effect, if any, that the opinion will have on EPA's BTA determination is unclear.

Riverkeeper II also invalidated the restoration provisions in the Phase II rule, and remanded those provisions to EPA. The Second Circuit reached the conclusion that restoration measures are not authorized by section 316(b) in step-one of the *Chevron* analysis. *See Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). The court found first that language in section 316(b) established nexus between certain characteristics of the intake structure and the selected technology. *See Riverkeeper II*, 475 F.3d at 109, quoting *Riverkeeper I*,

358 F.3d at 189, App. 46a-47a ("[r]estoration measures are not part of the location, design, construction, or capacity of cooling water intake structures.") The court also found that the statute's use of the word "minimize" precluded the use of "mitigation" to satisfy the technology requirement with after-the-fact restoration measures. *Id.* (discussing that Webster's dictionary defines "minimize" as meaning to reduce to the smallest extent possible.) Thus, the Second Circuit rejected the restoration provisions in the rule, because "EPA impermissibly construed [an unambiguous] statute by allowing compliance with section 316(b) via restoration measures," such as restocking fish killed by a cooling water intake structure. *Riverkeeper II*, 475 F.3d at 108-10, App. 43a-50a; *see also Riverkeeper I*, 358 F.3d at 189. The court remanded this aspect of the Phase II rule to EPA as well.

Finally, based on a plain reading of section 316(b) and the opinions of its sister circuit courts on this point, the Second Circuit rejected Industry Petitioners' argument that section 316(b) is not applicable to existing facilities, and further held that EPA could reasonably choose to implement section 316(b) requirements through discharge permits. *Riverkeeper II*, 475 F.3d at 122, App. 74a ("given the cross-references in section 316(b) to provisions governing both new and existing facilities, the EPA's reading is far more reasonable than Entergy's.")

REASONS FOR DENYING THE PETITIONS

There are no compelling reasons to grant the petitions. First, the Second Circuit properly remanded the Phase II rule to EPA for further consideration. Significantly, EPA is actively addressing the Second Circuit's remand order, and thus, the reach and import of the opinion in *Riverkeeper II* is unclear with respect to the question of whether EPA's cost analysis will affect its BTA determination. Moreover, and, importantly, the fact that EPA did not seek either rehearing or an *en banc* consideration before the Second Circuit, and has not petitioned for certiorari, reflects the United States' judgment that the Second Circuit's decision does not merit review at this time.

Second, *Riverkeeper II* is the first decision to construe the technology requirement set forth in section 316(b) as it relates to cooling water intake structures at existing facilities. The court used accepted and usual principles of statutory construction to reject EPA's outdated cost-benefit analysis; to reject the use of restoration measures as a *substitute* for technology-forcing standards applied at the intake, and to conclude that section 316(b) applies to existing facilities as well as to new.

Finally, the decision in *Riverkeeper II* is not in conflict with any other circuit court or with this Court on any issue raised in the petitions. No other court has construed this language differently. Indeed, all of the conclusions reached in *Riverkeeper II* are

consistent with section 316(b) of the Clean Water Act, consistent with other circuit court opinions and consistent with the precedents of this Court.

For these reasons, this case does not warrant consideration by this Court.

I. THE SIGNIFICANCE OF *RIVERKEEPER II* IS UNCERTAIN BECAUSE EPA IS RECONSIDERING THE PHASE II RULE ON REMAND.

The Second Circuit properly remanded the Phase II rule to EPA, and significantly, EPA neither sought rehearing, or consideration *en banc* below, nor has it filed its own certiorari petition here. Instead, EPA suspended the Phase II rule, almost in its entirety, while it "considers how to address the remanded issues." 72 Fed. Reg. 37,107/2 (July 9, 2007).

The Second Circuit's remand was proper with respect to EPA's BTA and EPA's authorization of the use of restoration measures. With respect to EPA's BTA determination, the primary basis for the Second Circuit's remand was that it properly could not review EPA's selection of compliance options because both EPA's explanation for its underlying BTA determination in the rule, and the administrative record itself lacked the information needed to review

the rule.[4] Thus, the Second Circuit remanded these central cost provisions of the Phase II rule to EPA. *See Riverkeeper II*, 475 F.3d at 101-05, App. 28a-38a. The Second Circuit explained that EPA has the "correlative responsibility to explain the rationale and factual basis for its decision, even though we show respect for the agency's judgment in both." *Id.* at 104, citing *Bowen v. American Hospital Ass'n*, 476 U.S. 610, 627 (1986), App. 35a. Absent such an explanation here, the Second Circuit directed EPA to provide "either a reasoned explanation of its decision or a new determination of BTA based on permissible considerations." *Id.* at 130, App. 93a; *see also id.* at 105, App. 37a (Second Circuit suggesting that, "EPA in reconsidering its selection of BTA on remand may alter the suite of technologies it originally selected.") Thus, the result of the cost analysis that EPA will perform in determining BTA, and whether the resulting BTA determination will change is uncertain.

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[4] *Riverkeeper II*, 475 F.3d at 101 ("the record *is unclear* as to the basis for the EPA's selection of the suite of technologies as BTA. . . ."); *id.* at 104 ("In a technical area of this sort, it is difficult for judges or interested parties to determine the propriety of the Agency's action *without a justification for the action* supported by clearly identified substantial evidence whose import is explained. The record evidence alone here, . . . is *oblique, complicated, and insufficient* to permit us to determine what the EPA relied upon in reaching its conclusion."); *id.* ("The EPA was required to *explain its judgment* and the basis for it. *It did not do so* here.") ("In short the *EPA's failure to explain* its decision *frustrates* effective *judicial review*.") (*Emphasis added*), App. 28a-36a.

With respect to the use of restoration, the Second Circuit correctly found the provisions of the Phase II rule that allowed facilities to comply with BTA requirements through after-the-fact attempts to restore already degraded water resources, to be inconsistent with the plain meaning of section 316(b). Still, the Second Circuit remanded the restoration provisions to be rewritten consistent with its decision.

While *Riverkeeper II* makes it clear that EPA cannot employ a cost-benefit analysis to determine BTA, or allow existing facilities to the use restoration measures in lieu of technology at the intake, to what degree or how these findings will affect EPA's final BTA determination is unclear. Only when the remand considerations are final, and the regulatory process complete, will the new requirements of the Phase II rule be potentially applicable to existing facilities. Only then, therefore, will the practical effect of the Second Circuit's decision on states, regulatory agencies, and permitted facilities be known.

Moreover, EPA has acknowledged that it "is precluded from applying the rule unless and until it takes further action to address the decision," stating directly, "[t]hus, today's action simply effectuates the legal status quo. . . ." 72 Fed. Reg. 37,107/3. Until EPA addresses the remand issues and promulgates a new final Phase II rule in response to the remand, Industry Petitioners are in the same position as a regulated community as they were before the Phase II rule was issued – as are the States. *Id.* (EPA directing that "until the Agency has considered and

resolved the issues raised by the Second Circuit's remand[,] [p]ermit requirements for cooling water intake structures at Phase II facilities should be established on a case-by-case best professional judgment (BPJ) basis.") Thus, the Phase II rule is in flux, and should not now be reviewed by this Court.

In short, prudence and discretion dictate that EPA be allowed to complete its reassessment of the cost-based determinations and restoration provisions in the Phase II rule before additional judicial resources are used in reviewing the evolving rule. Accordingly, this case does not merit this Court's attention.

II. *RIVERKEEPER II* IS A ROUTINE APPLICATION OF ESTABLISHED PRINCIPLES OF STATUTORY CONSTRUCTION.

The decision below involves an unexceptional, case-specific application of the principles that control when a court must defer to an agency interpretation. These guiding principles were articulated by this Court in *Chevron* and followed by the Second Circuit in *Riverkeeper II*. *See Riverkeeper II*, 475 F.3d at 95, App. 16a (starting its discussion with a correct statement of *Chevron's* two-step analysis).

Cost Considerations

In undertaking step-one of the *Chevron* analysis, the Second Circuit concluded that section 316(b) is unambiguous and does not permit EPA to conduct a

cost-benefit analysis in determining BTA for cooling water intake structures. The Second Circuit's opinion that a cost-benefit analysis is precluded under a routine construction of section 316(b) was based, in the first instance, on the language of section 316(b) itself, which the court stated, "plainly indicates that facilities must adopt the best technology available and that cost-benefit analysis cannot be justified in light of Congress' directive." *Riverkeeper II*, 475 F.3d at 98-99, App. 21a-26a. The court did not preclude EPA from all forms of cost consideration,[5] but found nothing in the unique text of section 316(b) itself that provides EPA with the authority to balance costs and environmental benefits when selecting BTA.

The Second Circuit also examined the ordinary meaning of the discharge provisions cross-referenced in section 316(b), and observed that, in light of the cross-references its ordinary reading of the technology standard in section 316(b) is also consistent with the technology-forcing nature of the discharge provisions. *See Riverkeeper II*, 475 F.3d at 98-99, App. 23a ("The BTA standard of section 316(b), . . . , is linguistically similar to the BAT standard of section 301 and the standard that applies to new sources under section 306"); *see also Riverkeeper II*,

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[5] The Second Circuit held that EPA may permissibly consider costs in two ways: (1) to determine what technology can be "reasonably borne" by the industry, and, (2) to engage in a cost-effectiveness analysis in determining BTA. *Riverkeeper II*, 475 F.3d at 99, App. 22a.

475 F.3d at 99-100, citing *Kennecott v. United States EPA*, 780 F.2d 445, 448 (4th Cir. 1985), App. 24a-26a ("In setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible"); *Natural Resources Defense Council, Inc. v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) ("The most salient characteristic of the Clean Water Act's statutory scheme, articulated time and again by its architects and embedded in the statutory language, is that it is technology forcing.")

The Second Circuit's construction of the statute with regard to the cost-benefit analysis does not break any new ground. Moreover, PSEG exaggerates the extent to which the Second Circuit relied on this Court's decision in *American Textile Manufacturers Institute, Inc. v. Donovan* ("*Donovan*"), 452 U.S. 490 (1981) to conclude that a cost-benefit analysis is not allowed under section 316(b). Even before referring to *Donovan* the court concluded that, "cost benefit analysis is not . . . supported by the language or the purpose of the statute." *Riverkeeper II*, 475 F.3d at 99, App. 24a. Section 316(b) directs EPA to select the best available technology for minimizing adverse environmental impact. The technology-forcing standard established in section 316(b) focuses on "available" technology and "minimization." Not straying from the textual reading of section 316(b), the Second Circuit turned to this Court's reasoning in *Donovan* and other opinions of this Court to provide support for the basic construction principle that Congress knows how to direct an agency to consider

costs and benefits. *See Donovan*, 452 U.S. at 509 ("When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute.") The Second Circuit's decision is also consistent with the ordinary rule of statutory construction that "[w]hen Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.") *See Keene Corp. v. United States*, 508 U.S. 200, 208 (1993) (internal quotation marks omitted) (quoting *Russello v. United States*, 464 U.S. 16, 23 (1983)).[6]

The Second Circuit's conclusion that EPA may consider costs in a limited fashion when selecting BTA, but that a cost-benefit analysis is prohibited under the statute, was reached because the unique language in section 316(b) calls for the "minimization of adverse environmental impacts," and technology-forcing nature of the sections cross-referenced in section 316(b) unambiguously reflect Congress' intent to do away with the cost-benefit analysis. The court's opinion was the result of a textbook application of ordinary *Chevron* step-one principles. The Second

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[6] In *Whitman v. American Trucking Associations, Inc.*, 531 U.S. 457, 467-68, 121 S.Ct. 903, 909-10 (2001), this Court held that, "Congress does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not one might say hide elephants in mouseholes."

Circuit's opinion, on this point, does not warrant this Court's review.

Restoration

Section 316(b) provides that the "location, design, construction, or capacity of cooling water intake structures" must "reflect the best technology available for minimizing adverse environmental impacts." In concluding that section 316(b) does not authorize the use of restoration measures as a substitute for BTA, the Second Circuit again adhered to a step-one *Chevron* analysis, holding that "Congress unambiguously expressed its intent in the statute." *Riverkeeper II*, 475 F.3d at 110, quoting *Chevron*, 467 U.S. at 842-43, 104 S.Ct. 2778, App. 48a ("If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.") Based on a straightforward *Chevron* analysis, the court rejected the use of restoration measures for two reasons: (i) restoration measures cannot be used to curtail or reduce the impacts caused by the intake itself, as is required by section 316(b); and (ii) restoration measures do not *minimize* impacts, as is required by the statute, but rather are implemented with the hope that they will *mitigate* impacts after they have already occurred.

Industry Petitioners argue that the use of the word "reflect" in section 316(b) means that the approved technology does not have to be incorporated

into the intake structure itself. From here, Industry Petitioners imply that because other permissible technologies, such as barrier nets and cooling towers, are likewise not part of the intake structure, restoration measures are no different and should have been permitted. The Second Circuit addressed this argument squarely when it was raised by EPA in *Riverkeeper II* – the statute is clear, restoration measures simply are neither related to the intake characteristics listed in section 316(b), nor do they constitute technology that *minimizes* environmental impact. *See Riverkeeper II,* 475 F.3d at 110, App. 49a ("[A] rule permitting compliance with the statute through restoration measures allows facilities to avoid adopting any cooling water intake structure technology at all, in contravention of the Act's clear language as well as its technology-forcing principle.")

Moreover, the Second Circuit observed that it had decided this very statutory construction issue in *Riverkeeper I* with respect to EPA's regulation of cooling water intake structures at new facilities:

> As we noted in *Riverkeeper I*, restoration measures substitute after-the-fact compensation for adverse environmental impacts that have already occurred for the minimization of those impacts in the first instance. The Agency's attempt to define the word "minimize" to include "compensati[on] . . . after the fact," 69 Fed. Reg. 41,628 *is simply inconsistent with that word's dictionary definition:* "to reduce to the smallest possible

> extent," Webster's Third New Int'l Dictionary 1438 (1986).

Riverkeeper II, 475 F.3d at 110 (*emphasis added*), citing *Riverkeeper I*, 358 F.3d at 189, App. 49a.

After this conventional textual analysis of section 316(b), the Second Circuit unanimously held, consistent with *Riverkeeper I*, that "EPA impermissibly construed the statute by allowing compliance with section 316(b) via restoration measures." *Id.*

Application to Existing Facilities

Entergy suggests that this case presents the opportunity for this Court to resolve whether an agency should be given deference when it interprets a statute that defines the scope of its authority. Entergy Pet. at 22. The question of whether section 316(b) applies to existing facilities is not a scope of authority issue – it simply required a straightforward reading of section 316(b) to determine whether *Congress* intended it to apply to existing facilities. Thus, EPA did not improperly assert, nor did it attempt to redefine the scope of its authority when it promulgated the Phase II rule pursuant to section 316(b).

Throughout the Clean Water Act, EPA's authority to regulate discharges indisputably extends to new and existing facilities alike. Indeed, it is well established that EPA is required by section 316(b) to promulgate regulations governing cooling water

intake structures at existing facilities in Phase II and III of its rulemaking process. *See Cronin v. Browner*, 90 F.Supp.2d 364 (S.D.N.Y. 2000).

The Second Circuit rejected Entergy's argument that the phrase "location, design, construction, and capacity," implicitly limits the applicability of section 316(b) to new facilities. It relied on the textual cross-references in section 316(b) to provisions that govern both new and existing facilities to conclude that section 316(b) articulates a single standard for both new and existing facilities. *Riverkeeper II*, 475 F.3d at 122, App. 74a-75a.

Entergy likewise argues that because section 316(b) neither dictates particular technologies to be used for cooling water intake structures, nor specifies a particular mechanism by which EPA is to implement its technology determinations under section 316(b), EPA is reaching beyond the scope of its authority in applying its regulations to existing facilities. This argument, too, is nothing more than a challenge to the deference that is afforded to EPA under step-two of its *Chevron* analysis. EPA has imposed intake requirements through discharge permits and the circuit courts have supported this implementation mechanism since the inception of the Clean Water Act.

In short, *Riverkeeper II* did not address the scope of EPA's authority, it addressed the applicability of section 316(b).

III. THERE IS NO SPLIT IN THE CIRCUIT COURTS ON ANY OF THE ISSUES RAISED BY INDUSTRY PETITIONERS.

Industry Petitioners argue that the Second Circuit's opinion in *Riverkeeper II* conflicts with the decisions of other circuit courts on three issues: whether section 316(b) precludes a cost-benefit analysis in determining BTA; whether section 316(b) sanctions the use of restoration measures as a substitute for technology-forcing standards; and whether section 316(b) applies to existing facilities, and in turn, can be implemented through discharge permits.

The Cost-Benefit Analysis

Industry Petitioners assert that the Second Circuit's opinion disregards a longstanding practice to allow cost-benefit analysis with respect to water intake regulation under section 316(b). PSEG Pet. at 24, 30. To support this assertion Industry Petitioners rely on *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306 (1st Cir. 1979) ("*Seacoast*"). Specifically, PSEG and UWAG cite *Seacoast* for the principle that the use of a cost-benefit analysis in determining BTA has always been the norm. UWAG Pet. at 25-28; PSEG Pet. at 24-25. *Seacoast* however, did not address the permissibility of a cost-benefit analysis at all. Rather, the First Circuit concluded only that the statute's legislative history indicates that cost is an acceptable consideration in determining whether the intake design "reflects the best technology available." *Seacoast*, 597 F.2d at 311. Contrary to the Industry

Petitioners' arguments, *Seacoast* does not endorse a cost-benefit analysis nor prescribe one.

Moreover, in citing *Seacoast,* Industry Petitioners fail to recognize that the cost-benefit analysis for setting effluent limitations under section 301(b)(2)(A) was replaced by the more stringent "best available technology" standard, under which EPA may consider the cost of achieving a reduction in effluent, but not the cost of achieving the effluent reduction as compared to the benefit achieved by the reduction. In the context of section 316(b), the Second Circuit recognized the distinction between considering cost in determining BTA and balancing cost against the benefit to be achieved by BTA.[7] The Second Circuit found support for this distinction in this Court's decision in *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64 (1980), where it recognized that the shift to BAT in section 301 fundamentally altered the way in which the EPA could factor cost into its Clean Water Act determinations. App. 21a. Thus, the Second Circuit's decision is not at variance with the *Seacoast* Court's dicta that cost is an "acceptable consideration" in determining whether an intake design reflects the best technology available. *Seacoast*, 597 F.2d at 311.

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[7] *Riverkeeper II*, 475 F.3d at 102, citing *Riverkeeper I*, 358 F.3d at 195, App. 30a ("Congress made only one distinction: while the Agency could consider the relationship between cost and benefits in establishing BPT, CWA Section 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B), it could consider cost insofar as it can be 'reasonably borne' by the industry, but not the relationship between cost and benefits, in establishing BAT.")

The Industry Petitioners also cite *BP Exploration & Oil, Inc.*, 66 F.3d 784 (6th Cir. 1995) and *Weyerhaeuser v. Costle,* 590 F.2d 1011 (D.C. Cir. 1978) in support of their claim of conflict among the circuits on the cost-benefit analysis issue. Entergy Pet. at 25-30; PSEG Pet. at 20-21. Neither case addressed the applicability of a cost-benefit analysis when establishing BTA under section 316(b).

In *BP Oil*, oil and gas industry petitioners challenged an EPA rulemaking that established pollution (effluent) discharge limitations promulgated under sections 301, 304 and 306. *BP Oil*, 66 F.3d at 789. Petitioners also challenged EPA's calculation of the cost of achieving the effluent limitations, but not EPA's failure to properly consider cost. In upholding EPA's rulemaking, the Sixth Circuit noted the factors, including cost, that EPA may consider in setting effluent limitations for an industry subject to "best available technology," and recognized that EPA was required to "institute progressively more stringent effluent discharge guidelines in stages." *Id.* Notably, the Court did not hold, or even suggest, that a cost-benefit analysis was proper in establishing such limitations and simply did not address the question of whether section 316(b) authorizes such an approach when determining BTA at an intake structure. Thus, *BP Oil* does not conflict with *Riverkeeper II* on the issue of cost-benefit analysis.

Similarly, there is no conflict presented by *Weyerhaeuser*, where petitioners challenged an EPA rulemaking setting effluent discharge limitations and

the calculated costs of implementation. Like *BP Oil*, the court in *Weyerhaeuser* did not address the question of whether a cost-benefit analysis under Section 316(b) is appropriate when establishing BTA for intake structures. Moreover, *Weyerhaeuser* predated the shift to best available technology recognized in *National Crushed Stone Ass'n*. *Weyerhaeuser* therefore presents no conflict with the decision in *Riverkeeper II*.

Nor do any of the other cases cited by the Industry Petitioners address the issue of whether Section 316(b) authorizes a cost-benefit analysis.[8] Thus they do not support the conclusion that there is a split among the circuit courts.

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[8] *See* UWAG Pet. at. 21, citing *United States Steel Corp. v. Train*, 556 F.2d 822 (7th Cir. 1977) (upholding EPA NPDES permit against challenge that State law should apply); Entergy Pet. at 32, citing *Gulf Restoration Network v. United States Dept. of Transportation*, 452 F.3d 362, 372 (5th Cir. 2006) (upholding environmental review and license issuance under Deepwater Port Act); Entergy Pet. at 32-33, citing *American Corn Growers Ass'n v. EPA*, 291 F.3d 1, 3 (D.C. Cir. 2002) (upholding EPA regional haze rulemaking under Clean Air Act); UWAG Pet. at 21, citing *United States Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977) (upholding EPA NPDES permit requiring monitoring at intake pursuant to Section 316(b) and finding assertion that EPA failed to compare costs and benefits of intake technologies not ripe).

Restoration

Industry Petitioners argue that there is also a conflict among the circuit courts with respect to whether restoration measures are a permissible substitute for technology at the intake structure under section 316(b). In fact, the Second Circuit in *Riverkeeper I* was the first to directly address this issue. *Riverkeeper I*, 358 F.3d at 189-91. *Riverkeeper I* rejected inclusion of restoration measures in lieu of technology at the intake at new facilities under the Phase I rule in light of the plain language of section 316(b). *Id.* at 191. The Second Circuit's decision to reject restoration here in the Phase II rule is based on the same analysis.

Industry Petitioners cite *Seacoast*, 597 F.2d at 309-11, in support of their claim that there is a split between the First and Second Circuits. PSEG Pet. at 28-29. Because *Seacoast* does not address whether section 316(b) authorizes restoration measures in lieu of technology at the intake, however, it is not in conflict with *Riverkeeper I* and *Riverkeeper II*.

Industry Petitioners also suggest that the Second Circuit is departing from a broad national consensus and that the Second Circuit decision threatens EPA's practice of requiring restoration measures in many environmental contexts, including the National Environmental Policy Act ("NEPA"), the Clean Water Act Section 404, the Endangered Species Act, and the Fish and Wildlife Coordination Act. PSEG Pet. at 30-31. Petitioners argue that many courts have affirmed

a federal agency's discretion to consider restoration in those contexts. This argument is erroneous. These decisions, which address restoration measures under distinct federal statutes, do not give rise to a conflict among the circuit courts on whether section 316(b) allows restoration measures in lieu of best technology available at intake structures. Moreover, none of the referenced statutes have the distinct and isolated provision mandating that EPA select a technology based on its ability to "minimize" adverse environmental impacts.

Petitioners also misconstrue the Second Circuit's holding with respect to restoration as a policy matter. The Court recognized that restoration measures could be beneficial, but held that EPA could not substitute restoration measures in place of technology at an intake structure. That holding does not undermine the importance of restoration or the ability of EPA or the States to use restoration measures in addition to the appropriate technology requirements at the intake as mandated by section 316(b).

Existing Facilities

Petitioner Entergy argues that there is a split among the circuit courts with respect to whether section 316(b) applies to existing facilities, and whether cooling water intake standards can be regulated in discharge permits. Contrary to Entergy's claim, the Second Circuit's holding did not expand the application of section 316(b) beyond its text, nor did it

equate the intake requirements of section 316(b) with discharge requirements of sections 301 and 306.

The courts have long recognized that section 316(b) applies to "existing" cooling water intake structures as well as to "new" structures, and that the National Pollutant Discharge Elimination System ("NPDES") permitting program is an appropriate mechanism for implementation. *See Riverkeeper II*, 475 F.3d at 122, quoting *E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 121 (1977), App. 74a ("Section 301(b), to which section 316(b) expressly refers, defines the effluent limitations that shall be achieved by existing point sources."); *see also United States Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977). The plaintiff, like Industry Petitioners here, argued that the requirements of section 316(b) applied only to a certain category of power plants, and that EPA could not impose section 316(b) requirements as a condition of NPDES permits. *See id.* at 849. The Seventh Circuit disagreed, holding that section 316(b) applies on its face to all technology-based requirements of the Clean Water Act. *Id.* at 849-50. The Seventh Circuit went on to confirm that the proper mechanism for implementing the requirements of section 316(b) was through conditions imposed in NPDES permits. *Id.*, citing *Appalachian Power Co. v. Train*, 545 F.2d 1351, 1371-72 (4th Cir. 1976).

Entergy's contention that *Riverkeeper II* creates a conflict with *Virginia Electric Power Co. v. Costle*, 566 F.2d 446 (4th Cir. 1977) is also incorrect. The issue in

Virginia Electric was a narrow one – whether the circuit courts had jurisdiction to review agency regulations issued pursuant to section 316(b) of the Clean Water Act. Entergy cites isolated language in the case for the proposition that section 316(b) regulations are not effluent limitations. But that issue was not in dispute there, *see id.* at 449, nor is it in dispute here. In fact, the Fourth Circuit's decision supports the proposition that section 316(b) intake technology requirements apply to existing facilities. Furthermore, the court, and the industry petitioners in that case, implicitly recognized that section 316(b) regulations could be implemented for existing facilities through NPDES permitting processes. *See id.* at 449.

Nor does *Riverkeeper II* create a conflict with *Natural Resources Defense Council v. EPA*, 859 F.2d 156 (D.C. Cir. 1988), as Entergy maintains. The issue before the D.C. Circuit there was whether EPA could impose non-water quality permit conditions in a NPDES discharge permit. EPA asserted that the National Environmental Policy Act ("NEPA") provides it with "supplemental authority" not only to consider additional environmental factors, "but to act on these factors by imposing any condition necessary to account for the environmental effects of the new facility." *Id.* at 169. The court concluded that EPA could not look to NEPA to expand its substantive powers. It held that "[a]ny action taken by a federal agency must fall within the agency's appropriate province under its organic statute(s)." *Id.* In contrast,

EPA here is acting within its express authority under section 316(b) of the Clean Water Act in promulgating standards that require "cooling water intake structures [to] reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. §1326(b).

CONCLUSION

For the foregoing reasons, the Industry petitions for a writ of certiorari should be denied.

Respectfully submitted,

For the State Respondents

PATRICK C. LYNCH
Attorney General

TRICIA O'HARE JEDELE
Special Assistant Attorney General
Counsel of Record
150 South Main Street
Providence, RI 02903
Phone: (401) 274-4400, Ext. 2400
Fax: (401) 222-3016

Dated: March 3, 2008

OPPOSITION BRIEF

MAR 3, 2008

Nos. 07-588, 07-589 and 07-597

In the Supreme Court of the United States

ENTERGY CORPORATION, PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

PSEG FOSSIL LLC, ET AL., PETITIONERS

v.

RIVERKEEPER INC., ET AL.

UTILITY WATER ACT GROUP, PETITIONER

v.

RIVERKEEPER INC., ET AL.

ON PETITIONS FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF FOR THE FEDERAL RESPONDENTS IN OPPOSITION

PAUL D. CLEMENT
Solicitor General
Counsel of Record

RONALD J. TENPAS
Assistant Attorney General

DAVID S. GUALTIERI
CYNTHIA J. MORRIS
JESSICA O'DONNELL
Attorneys

Department of Justice
Washington, D.C. 20530-0001
(202) 514-2217

QUESTIONS PRESENTED

1. Whether Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the Environmental Protection Agency (EPA) to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

2. Whether Section 316(b) prohibits the use of restoration measures as a means of minimizing the adverse environmental impact associated with cooling water intake structures.

3. Whether Section 316(b) authorizes EPA to regulate cooling water intake structures at existing facilities, as well as at new facilities.

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In the Supreme Court of the United States

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ON PETITIONS FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF FOR THE FEDERAL RESPONDENTS IN OPPOSITION

OPINION BELOW

The opinion of the court of appeals (07-589 Pet. App. 1a-86a) is reported at 475 F.3d 83.

JURISDICTION

The judgment of the court of appeals was entered on January 25, 2007. A petition for rehearing was denied on July 5, 2007 (07-589 Pet. App. 87a-89a). On September 25, 2007, Justice Ginsburg extended the time within which to file a petition for a writ of certiorari to and including November 2, 2007, and the petitions were filed on that date. The jurisdiction of this Court is invoked under 28 U.S.C. 1254(1).

STATEMENT

1. Steam electric power plants and other industrial and manufacturing facilities employ cooling water intake structures (intake structures) to absorb heat. The intake structures at such plants collectively withdraw large amounts of water each day from the Nation's lakes, rivers, and other water bodies. Among the adverse environmental impacts that occur as those structures withdraw water are "impingement," which occurs when aquatic organisms are trapped against the intake structures by the force of the inflowing water, and "entrainment," which occurs when smaller organisms are pulled into a facility's cooling system. See 07-589 Pet. App. 2a.

Section 316(b) of the Clean Water Act (CWA or the Act) requires that "[a]ny standard established pursuant to" Section 301 or 306 of the Act "and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. 1326(b). That provision is unique among CWA provisions in that it addresses the *intake* of water, in contrast to other

provisions that regulate the *discharge* of pollutants into waters of the United States.

The CWA does not define the substantive standard specified in Section 316(b)—"best technology available for minimizing adverse environmental impact" (BTA). 33 U.S.C. 1326(b). Section 316(b) does, however, cross-reference Sections 301 and 306 of the CWA by requiring that any standards established pursuant to those sections also require that intake structures reflect the BTA. *Ibid.* Section 301 authorizes the Environmental Protection Agency (EPA) to establish, among other things, effluent limitations based on the "best practicable control technology currently available" (BPT) or the "best available technology economically achievable" (BAT). 33 U.S.C. 1311(b)(1)(A) and (2)(A). Section 306 directs EPA to establish performance standards based on the "best available demonstrated control technology" (BADT). 33 U.S.C. 1316(a)(1).

The CWA specifies that, in establishing BPT, EPA must consider, among other factors, "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(1)(B). In determining BAT, EPA may consider factors similar to the BPT factors, including "the cost of achieving such effluent reduction * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(2)(B). The limitations and standards promulgated under Sections 301, 306, and 316(b) are implemented through National Pollutant Discharge Elimination System (NPDES) permits, which are issued for terms of up to five years, either by States with approved NPDES programs or, in States without an ap-

proved NPDES program, by EPA. See 33 U.S.C. 1342; 40 C.F.R. 125.90(a).

2. a. EPA first promulgated regulations implementing Section 316(b) in 1976. 41 Fed. Reg. 17,387. The Fourth Circuit remanded those regulations to EPA for procedural reasons. *Appalachian Power Co.* v. *Train*, 566 F.2d 451 (1977). When EPA subsequently withdrew the remanded regulations, it left intact a separate provision, which had not been remanded, that directs permitting authorities to use their best professional judgment to determine the BTA for each facility on a case-by-case basis. See 44 Fed. Reg. 32,854, 32,956 (1979); 40 C.F.R. 401.14. In 1977, EPA also issued a General Counsel opinion confirming its previous interpretation that, while Section 316(b) does not require a full cost-benefit analysis, it would be unreasonable "to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Central Hudson Gas & Elec. Corp.*, Op. EPA Gen. Counsel, NPDES No. 63, 1977 WL 28250, at *8 (July 29, 1977) (citation omitted). Thus, for more than 30 years, permitting authorities have considered costs and benefits to at least that extent in determining a facility's BTA.

b. In 1995, EPA entered into a consent decree establishing deadlines for proposing and taking final action on regulations implementing Section 316(b). That consent decree was later amended to provide for three phases of rulemaking addressing different categories of facilities. See 07-589 Pet. App. 4a-5a.

EPA published a Phase I rule in 2001. 66 Fed. Reg. 65,256. That rule governs new facilities that meet certain threshold specifications, and it provides that closed-cycle cooling technology (which reuses withdrawn wa-

ter) is generally the BTA for such facilities. *Id.* at 65,270-65,271. The Second Circuit largely upheld the Phase I rule. *Riverkeeper, Inc.* v. *United States EPA*, 358 F.3d 174, 181 (2004). The Phase II rule, which is at issue here, establishes requirements for intake structures at large, existing power plants that meet certain threshold specifications. 69 Fed. Reg. 41,576 (2004). The Phase III Rule, which governs new offshore and coastal oil and gas facilities and existing manufacturing and industrial facilities and smaller power plants, see 71 Fed. Reg. 35,006 (2006), is pending review in the Fifth Circuit. *ConocoPhillips Co.* v. *EPA*, No. 06-60662 (filed July 14, 2006).

In the Phase II rule at issue here, EPA selected a suite of technologies to reflect the BTA. 69 Fed. Reg. at 41,598-41,599. Those technologies include, among others, relocation of intakes, fine mesh passive screens, double-entry single exit traveling screens, velocity caps, larger intakes to decrease intake velocity, and barrier nets. See *id.* at 41,599. Based on that suite of technologies, EPA adopted national performance standards for reducing impingement mortality by 80%-95% and entrainment by 60%-90%. 40 C.F.R. 125.94(b). Facilities may use any combination of control technologies or operational controls, including restoration measures, to meet those standards. 40 C.F.R. 125.94(a)(1)-(4). A facility may request a variance that results in a site-specific BTA determination if the facility demonstrates that the cost of complying with the national performance standards is significantly greater than the benefits of compliance. 40 C.F.R. 125.94(a)(5).

EPA considered treating closed-cycle recirculating cooling towers, which it had determined to be the BTA for (new) Phase I facilities, as the BTA for (existing)

Phase II facilities. See 69 Fed. Reg. at 41,605-41,606. EPA rejected that alternative, however, because of its "generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations." *Id.* at 41,605. EPA explained that: the cost of closed-cycle recirculating cooling towers for Phase II facilities was many times higher than for Phase I facilities (at least $130-$200 million per tower, and probably more than that, with additional annual operating costs up to $20 million per facility); such cooling towers were less energy efficient than EPA's chosen alternatives; and, "[a]lthough not identical, the ranges of impingement and entrainment reduction are similar" under EPA's chosen option and the closed-cycle alternative. *Id.* at 41,605, 41,606.

3. After several parties petitioned for review, the petitions were consolidated in the Second Circuit. See 07-589 Pet. App. 1a-86a. As relevant here, the court of appeals held that: (i) EPA may not consider the relationship between an alternative's costs and benefits in determining the BTA, *id.* at 17a-33a; (ii) Section 316(b) precludes the use of restoration measures as a means of minimizing adverse environmental impacts, *id.* at 40a-45a; and (iii) EPA may apply Section 316(b)'s requirements to both new and existing facilities through the NPDES permit process, *id.* at 65a-70a.

a. The court of appeals recognized that "Section 316(b) does not itself set forth * * * the specific factors that the EPA must consider in determining BTA." 07-589 Pet. App. 18a. Because Section 316(b) cross-references Sections 301 and 306, however, the court looked to the factors that EPA may consider in implementing

various standards under those sections. *Id.* at 18a-20a. While those standards treat costs in different ways, including by requiring cost-benefit analysis in some circumstances, the court concluded that Congress had manifested a clear intent in those other provisions "to move cost considerations under the CWA from a cost-benefit analysis to a cost-effectiveness one." *Id.* at 20a. The court further asserted that, if Congress had intended to permit a comparison of costs and benefits, it would have said so expressly in the statute. *Id.* at 22a-23a.

The court of appeals then held that EPA may not engage in cost-benefit analysis, but instead "may permissibly consider cost in two ways: (1) to determine what technology can be 'reasonably borne' by the industry and (2) to engage in cost-effectiveness analysis." 07-589 Pet. App. 23a. After consulting the definition of "cost-effectiveness" found in an Office of Management and Budget (OMB) circular, the court explained that, in its view, permissible cost-effectiveness review is limited to choosing "a less expensive technology that achieves essentially the same results" as the best technology that industry can reasonably bear. *Id.* at 20a n.10, 23a-24a. "For example, assuming the EPA has determined that power plants governed by the Phase II Rule can reasonably bear the price of technology that saves between 100-105 fish, the EPA, given a choice between a technology that costs $100 to save 99-101 fish and one that costs $150 to save 100-103 fish * * * could appropriately choose the cheaper technology on cost-effectiveness grounds." *Id.* at 24a. Thus, the court concluded, "the specified level of benefit is * * * a narrowly bounded range, within which the EPA may permissibly choose between two (or more) technologies that produce essen-

tially the same benefits but have markedly different costs." *Id.* at 25a.

The court of appeals then remanded to EPA because, in the court's view, "it is unclear whether the Agency improperly weighed the benefits and the costs of requiring closed-cycle cooling." 07-589 Pet. App. 29a. Based in part on its cost-benefit holding, the court also invalidated the provision of the Phase II rule that authorized site-specific variances based on a comparison of costs and benefits at particular sites. *Id.* at 52a.

b. The court of appeals went on to hold that Section 316(b) unambiguously precludes EPA from considering restoration measures, such as restocking of fish and improvement of surrounding habitat, in determining the BTA for a facility. 07-589 Pet. App. 40a-45a. In limited circumstances, EPA had allowed facilities to use such measures to offset the adverse environmental impacts that would otherwise be caused by the operation of an intake structure. 40 C.F.R. 125.94(c). In the court of appeals' view, however, such mitigation measures do not "minimize" adverse environmental impacts within the meaning of Section 316(b), but instead "substitute after-the-fact compensation for adverse environmental impacts that have already occurred." 07-589 Pet. App. 44a.

c. The court of appeals also upheld EPA's determination that Section 316(b) applies to existing as well as new facilities. 07-589 Pet. App. 65a-70a. The court explained that "[S]ection 316(b), on its face, applies to existing facilities" because it cross-references Section 301, which applies to existing facilities. *Id.* at 68a. "At the very least," the court concluded, "EPA's view that section 316(b) applies to existing facilities is a reasonable interpretation of the statute." *Ibid.*

In so holding, the court of appeals rejected the contention that EPA could not use the NPDES permitting process to enforce Section 316(b)'s requirements against existing facilities. 07-589 Pet. App. 68a-70a. The court noted that EPA must enforce Section 316(b) against existing facilities through "some permit process," and NPDES permits are "used to enforce the effluent limitations of sections 301 and 306." *Id.* at 69a. Thus, the court held, "EPA's decision to use the NPDES process to enforce section 316(b) is not unreasonable." *Ibid.*

ARGUMENT

1. Petitioners contend (*e.g.*, 07-589 Pet. 17-27) that the court of appeals erred in holding that, in determining the BTA, EPA may not consider the relationship between a technology's costs and benefits. The government agrees. The court of appeals' holding to that effect is wrong, and is in tension with *Seacoast Anti-Pollution League* v. *Costle*, 597 F.2d 306 (1st Cir. 1979). There is, however, no square circuit conflict on that question. And, while the question presented has great significance, it is not yet clear whether the decision is sufficiently important to merit the Court's review.

To be sure, the uncertainty created by the erroneous decision below may have significant repercussions for facilities that undergo permitting decisions before the remand proceedings are completed. In the government's view, however, the full impact of the decision will not be clear until EPA completes proceedings on remand. For that reason, the government decided not to file a petition for a writ of certiorari in this case. If this Court were to grant the petitions, however, the government would support the position of the petitioners on this issue.

a. The court of appeals' holding that Section 316(b) unambiguously precludes comparison of a technology's costs and benefits is incorrect. Section 316(b) requires EPA to select the "best technology available for minimizing adverse environmental impact." 33 U.S.C. 1326(b). As the court of appeals recognized, "Section 316(b) does not itself set forth * * * the specific factors that the EPA must consider in determining BTA." 07-589 Pet. App. 18a.

Nor does anything in the general statutory phrase preclude EPA's conclusion that the statute permits consideration of cost-benefit analysis in determining the BTA. The "best" technology for minimizing adverse impacts is not necessarily the one that provides the greatest reduction of such impacts, without regard to any other considerations. Section 316(b) cross-references Sections 301 and 306 of the Act, which direct EPA to adopt various other "best" standards: the "best practicable control technology currently available" (BPT); the "best available technology economically achievable" (BAT); and the "best available demonstrated control technology" (BADT). See 33 U.S.C. 1311(b)(1)(A) and (2)(A), 1316(a)(1), 1326(b). Congress specified that, in establishing BPT, EPA must consider, among other factors, "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(1)(B). In determining BAT, EPA is not *required* to consider the relationship between costs and benefits, but Congress expressly provided that the agency may consider "the cost of achieving such effluent reduction * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(2)(B).

Those statutory provisions confirm that "the CWA's requirement that EPA choose the 'best' technology does not mean that the chosen technology must be the best [at] pollutant removal." *Citizens Coal Council* v. *United States EPA*, 447 F.3d 879, 903 (6th Cir. 2006) (en banc) (quoting *BP Exploration & Oil, Inc.* v. *United States EPA*, 66 F.3d 784, 796 (6th Cir. 1995)).[1]

The court of appeals asserted that, if Congress had intended to permit consideration of the relationship between costs and benefits, it would have clearly said so. 07-589 Pet. App. 22a-23a. By treating statutory silence as an unambiguous prohibition, the court turned normal rules of statutory construction and *Chevron* deference on their head. "[S]uch silence, after all, normally creates ambiguity. It does not resolve it." *Barnhart* v. *Walton*, 535 U.S. 212, 218 (2002); see *Chevron U.S.A. Inc.* v. *NRDC*, 467 U.S. 837, 843-844 (1984). Moreover, the court of appeals erred in construing *American Textile Manufacturers Institute* v. *Donovan*, 452 U.S. 490, 510 (1981), to erect a presumption against consideration of the relationship between costs and benefits. See 07-589 Pet. App. 22a-23a. *Donovan* upheld an agency's determination that it was not *required* to undertake cost-benefit analysis under a different statute. *Donovan*, 452 U.S. at 506. Thus, *Donovan*—which predated

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[1] The court of appeals asserted that BTA is more akin to BAT than BPT, and construed BAT (unlike BPT) to preclude cost-benefit analysis. 07-589 Pet. App. 18a-20a. All three standards, however, include the terms "best," "technology," and "available," and neither the BAT nor the BPT standard goes on to consider minimizing adverse environmental impacts. See 33 U.S.C. 1311(b)(1)(A) and (2)(A), 1326(b). As such, the court of appeals erred in concluding that the Act unambiguously treats BTA like BAT (but not BPT) for this purpose.

Chevron in any event—did not hold that silence unambiguously *precludes* consideration of costs and benefits.

More recent decisions applying *Chevron* principles of statutory construction have construed congressional silence as permitting cost-benefit analysis. See, *e.g.*, *Sierra Club* v. *United States EPA*, 314 F.3d 735, 744 (5th Cir. 2002); *Michigan* v. *United States EPA*, 213 F.3d 663, 678-679 (D.C. Cir. 2000), cert. denied, 532 U.S. 903, and 532 U.S. 904 (2001). The District of Columbia Circuit, for example, has explained that "[i]t is only where there is clear congressional intent to preclude consideration of cost that we find agencies barred from considering costs." *Id.* at 678 (internal quotation marks and citation omitted). The court of appeals erred by relying on the opposite presumption in this case.

The court of appeals confirmed its error by purporting to micro-manage the agency's decisionmaking by establishing rules that cannot be found anywhere in the Act. The court concluded, for example, that EPA may consider costs as part of cost-effectiveness but not cost-benefit analysis—terms that appear nowhere in the statute. After consulting the definition of "cost-effectiveness" found in an OMB circular that does not purport to interpret Section 316(b), the court proclaimed that EPA could adopt a significantly cheaper technology that would save 99-101 fish instead of 100-103 fish. 07-589 Pet. App. 20a & n.10, 24a. While it is not clear what result the court of appeals would reach if five or ten fish were potentially affected instead of one or two, the point for present purposes is that the court of appeals' freelancing violates *Chevron* by usurping the agency's role of construing and filling in an ambiguous statute.

Indeed, the court of appeals also agreed to let EPA consider other practical factors, such as energy effi-

ciency and countervailing environmental effects. 07-589 Pet. App. 24a n.12. While those factors are very important considerations, the lines drawn by the court of appeals between what it will and will not permit the agency to consider are by no means required by the statute; instead, they are simply the court of appeals' preferences imposed on the agency, in violation of *Chevron*.

b. The court of appeals' decision is also in tension with the First Circuit's decision in *Seacoast*, *supra*. In determining the BTA in that case under Section 316(b), EPA rejected an alternative that would have further minimized entrainment "only slightly," and would have cost an additional $20 million. *Seacoast*, 597 F.2d at 311. EPA rejected that alternative because "the costs would be 'wholly disproportionate to any environmental benefit.'" *Ibid.* (quoting EPA's opinion). After resolving a factual dispute concerning the magnitude of the costs, the First Circuit stated that "[p]etitioners, wisely, do not argue that the cost may not be considered." *Ibid.* Rather, "[t]he legislative history clearly makes cost an acceptable consideration in determining whether the intake design 'reflect[s] the best technology available.'" *Ibid.* (quoting Staff of the Senate Comm. on Public Works, 93d Cong., 1st Sess., *A Legislative History of the Water Pollution Control Act Amendments of 1972*, at 264 (Comm. Print 1973)).

Seacoast does not present a square conflict for two reasons. First, it appears from the court of appeals' brief discussion that the permissibility of considering costs was not in dispute in that case. 597 F.2d at 311. Second, while the First Circuit clearly stated that EPA may consider costs, the court did not explicitly discuss the *extent* to which costs may be considered. See *ibid.*

Nonetheless, *Seacoast* upheld EPA's rejection of an alternative on the ground that its costs were wholly disproportionate to its benefits—a legal standard that cannot be squared with the court of appeals' decision below. Indeed, the court of appeals below faulted EPA for applying a standard that, in the court of appeals' view, resembled one that looks to whether costs are "wholly out of proportion" to benefits. 07-589 Pet. App. 19a (quoting *EPA* v. *National Crushed Stone Ass'n*, 449 U.S. 64, 71 n.10 (1980)). In this case, therefore, the court of appeals rejected essentially the same legal standard that EPA had applied in *Seacoast*.

c. While the court of appeals' decision is undoubtedly important, and it unjustifiably constrains EPA's consideration of costs and benefits, it is unclear how significant the decision ultimately will prove to be. The court of appeals did not determine that EPA had considered costs in an unlawful fashion; instead, it found EPA's rationale "unclear" and remanded for further proceedings. 07-589 Pet. App. 26a. In doing so, the court of appeals noted that EPA could permissibly consider the energy impacts, countervailing environmental effects, and cost-effectiveness of alternatives. *Id.* at 24a n.12.

Nonetheless, it is clear that the court of appeals' decision will be disruptive. The Phase II rule affects approximately 550 facilities that account for approximately 40% of our Nation's energy production. See 69 Fed. Reg. at 41,608; Office of Water, EPA, *Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule* A3-6, A3-13 (2004). Because those facilities' NPDES permits expire every five years, see 33 U.S.C. 1342(a)(3) and (b)(1)(B), many affected permitting decisions may be made before EPA com-

pletes the remand proceedings and an appellate court reviews those proceedings. Until EPA completes the remand proceedings, permitting authorities will issue permits on a case-by-case basis based on their best professional judgment. At least in the Second Circuit, however, they will no longer be able to consider the relationship between costs and benefits. That will mark a sharp break from past practice, because EPA and other permitting authorities have understood for at least 30 years that cost-benefit analysis is an appropriate consideration. See, *e.g.*, *Central Hudson*, Op. EPA Gen. Counsel, NPDES No. 63, 1977 WL 28250, at *8 (explaining that it would be "unreasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained") (citation omitted). The short-term consequences of the resulting uncertainty will be magnified by the fact that existing facilities have made enormous investments based, in part, on their reliance on past permitting decisions made under a different legal standard.

As EPA determined in the Phase II rulemaking, any requirement that existing facilities must adopt closed-cycle cooling technology would have dramatic effects. Nationwide, the cost would exceed $3.5 billion annually, and possibly be much more than that. 69 Fed. Reg. at 41,605. Such controls would also impose a significant "energy penalty" by reducing the amount of energy created by affected plants while forcing others to remain idle during extensive retrofits (or to close their doors forever). See *ibid.* At this time, however, any assessment of the likely consequences is speculative, as explained above.

It is also unclear whether the court of appeals' decision will have practical consequences beyond the

Phase II rule. EPA's Phase III rule expressly relies on cost-benefit considerations. *E.g.*, 71 Fed. Reg. at 35,015. Challenges to that rule are currently pending before the Fifth Circuit, and the United States is defending EPA's consideration of the relationship between costs and benefits in that rulemaking. See U.S. Br. at 54-73, *ConocoPhillips*, *supra* (No. 06-60662). If the Fifth Circuit were to agree with the Second Circuit, the practical importance of the question would be magnified. If the Fifth Circuit were to disagree with the Second Circuit, the resulting circuit conflict would also weigh in favor of this Court's review. At this juncture, however, it is not clear that the consequences of the court of appeals' ruling below are sufficiently important to satisfy this Court's *certiorari* criteria.

2. In addition to challenging the court of appeals' erroneous cost-benefit holding, petitioners argue (*e.g.*, 07-589 Pet. 28-31) that the court of appeals erred in holding that the CWA precludes the use of restoration measures to minimize the adverse environmental impacts of cooling water intake structures. While the court of appeals' holding on that issue is wrong as well, it does not warrant further review at this time.

As discussed, the statute requires that "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. 1326(b). EPA's regulations permit the use of restoration measures (instead of, for example, improvements to the equipment used in intake structures) when, among other things, "the impacts to fish and shellfish * * * within the watershed [through the use of restoration measures] will be comparable to those which would result" from other compliance methods. 40 C.F.R. 125.84(d)(1). That

is a reasonable interpretation of the statutory text, because it provides a common sense way of minimizing environmental impacts in a cost-effective manner.

The court of appeals construed Section 316(b) to require that BTA be implemented through "the location, design, construction, or capacity of cooling water intake structures." 07-589 Pet. App. 44a. Restoration measures are, however, part of the overall "design" of such structures. In any event, the statute requires only that the design "reflect[]" BTA, and the design does so when restoration measures help the facility achieve that level of protection. The court of appeals also thought that "minimizing adverse environmental impact" under the statute unambiguously requires minimizing that impact before any consequence occurs, as opposed to using restoration measures to replace, for example, entrained organisms with new organisms. 07-589 Pet. App. 44a. But nothing in the statute requires minimization to take either form, so long as the end result is comparable. Thus, if the Court were to grant the petitions, the government would support the position of the petitioners on this issue as well.

The restoration-measures question does not, however, warrant further review at this time. No other court of appeals has held that restoration measures are a permissible means of compliance under Section 316(b). While the court of appeals' decision has the potential to be disruptive and to require inefficient and wasteful results at existing facilities that had intended to rely upon restoration measures, the issue is not so exceptionally important as to warrant review in the absence of a circuit conflict. The court of appeals' holding is limited to Section 316(b), and does not extend to the use of restoration measures under other provisions of the CWA or

other environmental statutes. Moreover, the permissibility of restoration measures lacks the far-reaching significance of the more fundamental cost-benefit question described above, because such measures are simply one means of complying with BTA once BTA is established.

3. Alone among the petitioners, Entergy also argues (07-588 Pet. 15-25) that the court of appeals erred in upholding EPA's determination that Section 316(b) applies to existing facilities. The court of appeals' holding on that point is correct and does not warrant further review.

a. As noted, Section 316(b) requires that "[a]ny standard established pursuant to section [301] of [the CWA] or section [306] of [the CWA] and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. 1326(b). The opening phrase establishes the scope of Section 316(b)'s applicability—*i.e.*, standards developed pursuant to Sections 301 and 306 and applicable to point sources—while the closing phrase establishes its substantive requirement—*i.e.*, that the location, design, construction, and capacity of intake structures reflect BTA. Significantly, while Section 306 addresses only new sources, 33 U.S.C. 1316(b), Section 301 provides for limitations on existing sources, as Entergy concedes (07-588 Pet. 5). See 33 U.S.C. 1311(b). Thus, by mandating that "*[a]ny* standard established pursuant" to Sections 301 or 306 reflect BTA for intake structures, Section 316(b) unambiguously imposes its requirements on both new and existing facilities. 33 U.S.C. 1326(b) (emphasis added).

Entergy argues (07-588 Pet. 15-16) that Section 316(b) is limited to new sources because it imposes requirements on "the location, design, construction, and capacity of cooling water intake structures." 33 U.S.C. 1326(b). As discussed, however, Section 316(b) separately defines its scope by stating that it applies to "[a]ny standard established pursuant to" Sections 301 and 306. *Ibid.*

Even if Section 316(b) does not unambiguously apply to existing facilities, EPA's interpretation is certainly reasonable and entitled to deference. Applying Section 316(b) to existing facilities furthers the CWA's general objective "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. 1251(a). It also fulfills Section 316(b)'s particular objective of minimizing adverse environmental impacts at facilities that are subject to Section 301 standards. Moreover, EPA has a longstanding and consistent practice of applying Section 316(b) to existing facilities, dating back to its 1977 regulations and a general counsel opinion that same year. See 71 Fed. Reg. at 35,011; *Central Hudson*, Op. EPA Gen. Counsel, NPDES No. 63, 1977 WL 28250, at *6.

b. Entergy nonetheless argues (07-588 Pet. 17-19) that its position is "confirmed by the absence of any CWA mechanism for imposing new requirements relating to the intake of water on existing facilities." As the court of appeals determined, however, EPA may implement Section 316(b) through the NPDES permitting process. 07-589 Pet. App. 68a-70a.

As discussed, Section 316(b) requires that standards established under Sections 301 and 306 must comply with Section 316(b)'s requirements. Section 301 and 306 standards are, in turn, implemented through NPDES

permits. See 33 U.S.C. 1342(a)(1). Indeed, the Act authorizes EPA to "issue [an NPDES] permit for the discharge of any pollutant * * * upon condition that such discharge will meet * * * *all applicable requirements* under sections [301 and 306]." *Ibid.* (emphasis added). Because the Act ties Section 316(b)'s requirements to standards established under Section 301, and the Act further directs that NPDES permits contain all applicable Section 301 requirements, the Act "implicitly requires the Administrator to insure compliance with § 316(b) as one of the permit conditions." *United States Steel Corp.* v. *Train*, 556 F.2d 822, 850 (7th Cir. 1977).

Entergy argues (07-588 Pet. 17-18) that Section 402(a)(1), 33 U.S.C. 1342(a)(1), which authorizes the issuance of NPDES permits, *requires* only that such permits mandate that the "discharge" of a pollutant comply with Section 301 requirements, whereas Section 316(b) governs the intake, as opposed to discharge, of water. But the intake and discharge of water are closely associated with one another, and there is no reason to read Section 402(a)(1) as *precluding* NPDES permits from including all Section 301 requirements. As the court of appeals observed, Entergy's reading cannot be squared with Section 316(b)'s clear application to existing sources. 07-589 Pet. App. 69a-70a. At a bare minimum, EPA's interpretation is reasonable.

c. There is no division among the circuits on the question presented here. Indeed, Entergy does not assert a circuit conflict on the question whether Section 316(b) applies to existing sources; instead, it asserts (07-588 Pet. 18-19) only a circuit conflict on the subsidiary question whether Section 316(b) may be enforced through NPDES permits. There is no such conflict. The District of Columbia Circuit's decision in *NRDC* v. *Uni-*

ted States EPA, 859 F.2d 156 (1988) (cited at 07-588 Pet. 19) does not even involve Section 316(b); instead, it addresses the question whether EPA may include conditions in NPDES permits based on the requirements of an entirely different statute, the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.* See *NRDC*, 859 F.2d at 168-170. As the District of Columbia Circuit explained, NEPA—unlike Section 316(b) —is a "procedural" statute that "does not expand the agency's substantive powers." *Id.* at 169, 170.

Nor is there a conflict with *Virginia Electric & Power Co.* v. *EPA*, 566 F.2d 446 (4th Cir. 1977) (*VEPCO*) (cited at 07-588 Pet. 18-19). *VEPCO* did not involve NPDES permits. Instead, the "sole question" there was whether the district court or the court of appeals had original jurisdiction to review regulations implementing Section 316(b). *VEPCO*, 566 F.2d at 447. That question turned on "whether the regulations constitute 'effluent limitation[s] or other limitation[s]' within the meaning of [33 U.S.C. 1369(b)(1)(E)]." 566 F.2d at 449. It was undisputed that the regulations were not effluent limitations. *Ibid.* The court of appeals held that the regulations were other limitations for purposes of the jurisdictional provision, primarily because "§ 316(b) itself seems to indicate its limitations are to be adopted under §§ 301 and 306." *Id.* at 450. Nothing in *VEPCO*'s analysis, much less its jurisdictional holding, conflicts with the court of appeals' decision in this case; if anything, *VEPCO* supports the court of appeals' determination that Section 316(b)'s requirements are requirements under Sections 301 and 306.

d. Entergy argues (07-588 Pet. 22-25) that the court of appeals' decision implicates a circuit conflict on whether courts must defer to an agency's reasonable inter-

pretation of its own statutory jurisdiction. That question is not properly presented here, for at least two reasons. First, it was not timely raised or considered below. Entergy raised that contention for the first time in its reply brief in the court of appeals, and therefore has forfeited it. See, *e.g.*, *United States* v. *Gabriel*, 125 F.3d 89, 100 n.6 (2d Cir. 1997). Nor did the court of appeals address the question. Thus, the question is not properly presented here. See, *e.g.*, *Travelers Cas. & Sur. Co. of Am.* v. *Pacific Gas & Elec. Co.*, 127 S. Ct. 1199, 1208 (2007).[2]

Moreover, the court of appeals had an even more fundamental reason for not addressing the question: the court held that Section 316(b) "plainly applies" "on its face * * * to existing facilities." 07-589 Pet. App. 68a, 70a; see *id.* at 69a (emphasizing the "clear textual basis" for that conclusion). Because the court of appeals held that the statute is unambiguous, it had no occasion to analyze the deference that would be due to EPA's reasonable construction of an ambiguous statute. To be sure, the court of appeals stated, apparently as an alternative holding, that "at the very least, the EPA permissibly interpreted the statute to cover existing facilities." *Id.* at 65a; see *id.* at 68a. But the court's analysis rested on the plain language of the statute, see *id.* at 67a-68a, and, as discussed above, the court concluded that the text is "clear" and "plain[]." *Id.* at 69a, 70a. Thus, the court's holding does not appear to rely on deference.

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[2] In a string-cite for the general proposition that agencies' interpretations must be reasonable, Entergy's opening brief in the court of appeals included a parenthetical that said, "discretion inappropriate regarding matters of agency authority." Entergy C.A. Br. 33. That brief statement in a parenthetical to a case cited for a different proposition did not adequately raise the issue.

Even if the basis for the court's holding were unclear, that lack of clarity would make this case a poor vehicle for considering the deference question.

In any event, under *Chevron*, EPA's reasonable interpretation of the statutes it administers is entitled to deference, even if those statutes are considered jurisdictional. Indeed, an agency's construction of statutory provisions it is charged with administering normally affects the scope of the agency's regulatory authority and responsibilities. As a result, Entergy's position would all but eviscerate *Chevron*. In *Chevron* itself, this Court deferred to EPA's interpretation of the Clean Air Act's statutory term "stationary source"—an interpretation that determined the scope of EPA's regulatory responsibilities and authority. See *Chevron*, 467 U.S. at 839-840. Entergy makes no attempt to explain how its position can be squared with *Chevron*, and it cannot. Indeed, just three months before this Court decided *Chevron*, it held that an agency was entitled to deference on the scope of its jurisdiction and authority. *NLRB* v. *City Disposal Sys., Inc.*, 465 U.S. 822, 830 n.7 (1984). Since then, this Court has never held otherwise.

Entergy argues (07-588 Pet. 24-25) that two courts of appeals have nonetheless held that an agency's view of its own jurisdiction is not entitled to deference. Those cases are distinguishable. *Holderfield* v. *MSPB*, 326 F.3d 1207, 1208 (Fed. Cir. 2003), involved the Merit Systems Protection Board's (MSPB's) interpretation of the statutes that, quite literally, determine the scope of its adjudicatory jurisdiction. *Holderfeld* is distinguishable not only because it involves adjudicatory jurisdiction as opposed to regulatory authority, but also because the Federal Circuit reviews most of the MSPB's legal determinations *de novo*, not only its jurisdictional ones. See,

e.g., *King* v. *Department of the Navy*, 130 F.3d 1031, 1033 (Fed. Cir. 1997). Moreover, the Federal Circuit *does* defer to MSPB regulatory (as opposed to adjudicatory) interpretations of its jurisdiction. See *Garcia* v. *DHS*, 437 F.3d 1322, 1338 (2006) (en banc).

Petitioner is correct (07-588 Pet. 24-25) that, in the context of a different statute, the Seventh Circuit has declined to defer to an agency's interpretation of the scope of its regulatory authority. *Northern Ill. Steel Supply Co.* v. *Secretary of Labor*, 294 F.3d 844, 846-847 (2002). That case did not, however, involve Section 316(b) (or the CWA more generally). In any event, as discussed above, this case does not properly present the question, and the Seventh Circuit's decision is clearly wrong.

e. Finally, Entergy's prediction (07-588 Pet. 20-21) that the court of appeals' decision will have calamitous consequences is premature and is not supported by the record. Indeed, Entergy points (*id.* at 20) only to the cost of retrofitting nuclear facilities—which comprise a small percentage of the relevant facilities—with closed-cycle cooling towers. As discussed, however, the court of appeals' decision does not necessarily require that result on remand. Thus, while Entergy's arguments underscore the importance of the cost-benefit issue, they do not justify further review of the court of appeals' holding that Section 316(b)'s requirements apply to both new and existing facilities.

CONCLUSION

Although the decision below is incorrect in important respects, and has great potential practical importance, and the government would support reversal in the event that certiorari were granted, the petitions for a writ of certiorari should be denied.

Respectfully submitted.

PAUL D. CLEMENT
Solicitor General

RONALD J. TENPAS
Assistant Attorney General

DAVID S. GUALTIERI
CYNTHIA J. MORRIS
JESSICA O'DONNELL
Attorneys

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REPLY BRIEF

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IN THE

Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,
v.
ENVIRONMENTAL PROTECTION AGENCY ET AL.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Second Circuit

PETITIONER'S REPLY BRIEF

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. Pearl Street
Jackson, MS 39201
(601) 969-2542

ELISE N. ZOLI
Counsel of Record
KEVIN P. MARTIN
GOODWIN PROCTER LLP
53 State Street
Boston, MA 02109
(617) 570-1000

Counsel for the Petitioner

March 18, 2008

Corporate Disclosure Statement

Entergy, a Delaware corporation, is a publicly traded company, and no publicly-held company has a 10% or greater ownership interest in Entergy.

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Certiorari is warranted here to address undisputed splits among the courts of appeals over an issue of unquestioned national importance: the limits of EPA's authority under the Clean Water Act ("CWA") to close or retrofit the nation's existing electric supply to protect early life stages of fish. EPA claims authority to issue new standards for cooling water *intake* structures under section 316(b) of the Act, 33 U.S.C. § 1326(b), and to impose them on existing facilities through so-called NPDES *discharge* permits. Brushing aside the absence of any such authority in the Act as a "textual hiccup," Pet. App. 75a, the Second Circuit deferred to EPA's arrogation of authority.

In its brief in opposition EPA now concedes, as it must, that lower courts are divided on the question whether to defer to agencies on the extent of agency jurisdiction. Respondents are also unable to distinguish the D.C. Circuit holding that NPDES permits may not be used to impose non-discharge requirements. Respondents' arguments that certiorari is not merited at this juncture are individually and collectively unconvincing; their suggestion that EPA's assertion of authority may be reversed or remedied on remand rings particularly hollow.

A. Conflicts Among the Courts of Appeals Over the Existing Facilities Question Merit This Court's Review

1. EPA concedes that, unlike the Second Circuit in this case, see *infra* at 3–5, "the Seventh Circuit has declined to defer to an agency's interpretation of the scope of its regulatory authority." U.S. Br. at 24 (citing *Northern Ill. Steel Supply Co.* v. *Secretary of*

Labor, 294 F.3d 844 (7th Cir. 2002)). Thus, a square conflict on an important issue exists.

The Seventh Circuit, however, is not alone in declining to defer to agencies over jurisdiction, contradicting EPA's position that *Chevron* provides a clear answer. See U.S. Br. at 23. Other courts have acknowledged the existence of a live dispute over the issue. See, *e.g.*, *O'Connell* v. *Shalala*, 79 F.3d 170, 176 n. 6 (1st Cir. 1996) (noting that "[t]he Supreme Court has never taken a clear institutional stand" on the issue); *Newton* v. *FAA*, 457 F.3d 1133, 1137 (10th Cir. 2006) (recognizing that the issue "has been a matter of dispute"). While EPA attempts to distinguish it as an "adjudicatory jurisdiction" case rather than a "regulatory jurisdiction" case, a distinction without a relevant difference, *Holderfield* v. *Merit Sys. Prot. Bd.*, 326 F.3d 1207, 1208 (Fed. Cir. 2003), also held that deference is not owed to agency determinations of their own jurisdiction. And EPA does not contest that the D.C. Circuit, since *Chevron*, has opined that "it seems highly unlikely that a responsible Congress would implicitly delegate to an agency the power to define the scope of its own power." *New York Shipping Assoc.* v. *Federal Maritime Comm'n*, 854 F.2d 1338, 1363 n. 9 (D.C. Cir. 1988) (quoting *American Civil Liberties Union* v. *FCC*, 823 F.2d 1554, 1567 n. 32 (D.C. Cir. 1987)).

The scholarly debate around this question underscores the divisions in authority and the need for this Court's direction. As Professor Sunstein has observed, "[t]he Supreme Court has divided on the question of whether *Chevron* applies to jurisdictional questions, an issue that remains unsettled in the lower courts." Cass Sunstein, *Beyond Marbury: The Executive's Power To Say What the Law Is*, 115 Yale

L.J. 2580, 2604 (2006). See also Thomas Merrill, *Judicial Deference to Executive Precedent*, 101 Yale L.J. 969, 1024–25 (1992); Ernest Gellhorn and Paul Verkuil, *Controlling Chevron-Based Delegations*, 20 Cardozo L. Rev. 989 (1999); Elizabeth Garrett, *Legislating Chevron*, 101 Mich. L. Rev. 2637, 2673–74 (2003); Thomas Merrill, *Rethinking Article I, Section I: From Nondelegation to Exclusive Delegation*, 104 Colum. L. Rev. 2097, 2173–74 (2004).

To downplay the acknowledged split in authority, EPA argues that the Seventh Circuit decision "did not * * * involve section 316(b) (or the CWA more generally)." U.S. Br. at 24. But deference is a core principle of broad application; the cert-worthiness of the questions whether and when deference should be granted to agency assertions of jurisdiction does not depend on whether cases addressing those issues involve the same provision or statute. Such a hurdle to review would unduly limit this Court's opportunities to redress regulatory over- or under-reach.

Taking a different tack, Respondents assert that the Second Circuit's decision "*does not appear* to rely on deference." U.S. Br. at 22 (emphasis added). The decision below, however, leaves no room for doubt that, but for deference, the Second Circuit could neither have surmounted the plain language of the Act (relegated to a "textual hiccup" under its deferential standard), nor the Act's indisputable limits, particularly what the Second Circuit characterized as the "harder question" of the limited reach of Section 402 solely to the discharge, not the intake of, water.

In particular, the court introduced the existing facilities issue by stating that "EPA permissibly

interpreted the statute to cover existing facilities and that its interpretation is therefore entitled to deference under *Chevron*," App. 72a, then consistently repeated the deference mantra that EPA's reading of the Act was "reasonable." See *id.* at 74a ("EPA's reading is far more reasonable than Entergy's"); *id.* at 75a ("At the very least, the EPA's view that section 316(b) applies to existing facilities is a reasonable interpretation of the statute, and we therefore accord it deference"). Given how the court actually considered the issue, its passing reference to the "plain language" of the Act in a rote summary of its earlier conclusion that deference was warranted amounts to a *non sequitur*.

Moreover, the Second Circuit indisputably deferred to EPA's authority to impose new section 316(b) requirements on existing facilities via the periodic NPDES permitting process. The decision below speaks only in terms of "reasonableness," never mentioning "plain language," and concedes that a "textual basis for the EPA to regulate cooling water intake structures during the periodic permitting process applicable to the discharge of pollutants is not immediately apparent." App. 75a. Only by ignoring the actual language of the Act as a "textual hiccup" was the court able to conclude that "the EPA's decision * * * is not unreasonable." *Id.* at 75a–76a; *id.* at 76a ("it is at least reasonable to conclude" that NPDES permits may impose new section 316(b) requirements); *ibid.* ("It is a fair conclusion that section 402 implicitly requires permitting authorities to ensure compliance with section 316(b) as a [NPDES] permit condition"). The court's stark conclusion that "[s]ection 402 thus does not undermine the deference to which the Agency's

interpretation of section 316(b) is entitled under *Chevron*" eliminates any doubt. *Id.* at 77a.

Respondents implausibly contend that Entergy waived the deference argument. As EPA concedes, however, Entergy argued in its opening brief below that "discretion [is] inappropriate regarding matters of agency authority." U.S. Br. at 22 & n.2 (quoting Entergy C.A. Br. at 33). Moreover, in its reply brief, Entergy specifically directed the Second Circuit to the Seventh Circuit's decision in *Northern Illinois*. See Entergy C.A. R. Br. at 19. The Second Circuit was briefed on this precise discretion issue, yet, as discussed *supra*, expressly deferred to EPA on the existing facilities issue. The waiver argument, accordingly, is meritless.

In short, although unsurprisingly interested in preserving broad deference to its decision-making, EPA's arguments, and those of the other Respondents, cannot hide the fact that since *Chevron* a significant split has developed among the courts of appeals (and in academia) concerning judicial deference to agency assertions of jurisdiction.

2. The Second Circuit also deferred to EPA by concluding that it may impose new section 316(b) requirements on existing facilities through NPDES permits issued under section 402 of the Act. This interpretation of EPA's authority under section 402—the only mechanism any Respondent has put forward by which EPA may impose new section 316(b) requirements on existing facilities—implicates another split in circuit authority requiring resolution by this Court. See Pet. at 17–20.

On its face, section 402 of the CWA only permits EPA to issue "a [NPDES] permit for the discharge of

any pollutant * * * upon condition that *such discharge*" will meet certain requirements, including, for example, the discharge requirements of sections 301 and 306 of the Act. See 33 U.S.C. § 1342(a)(1) (emphasis added). In *Natural Res. Def. Council* v. *EPA*, 859 F.2d 156, 170 (D.C. Cir. 1988) ("*NRDC*"), the D.C. Circuit held that EPA "is powerless to impose permit conditions unrelated to the discharge itself." Under the D.C. Circuit's reasoning, conditions relating to the *intake* of water—not being "conditions []related to the discharge itself"—could not be imposed through NPDES permits. Yet the Second Circuit, in deference to EPA, held that the agency could do precisely that.

Respondents argue that *NRDC* is distinguishable because it involved an attempt to use NPDES permits to impose the requirements of a different statute. See U.S. Br. at 21. The D.C. Circuit, however, did not rest its holding on that basis; as quoted above, it rejected EPA's rulemaking because it sought to "to impose permit conditions unrelated to the discharge itself." EPA's suggestion that it may not be "required" to impose non-discharge requirements through NPDES permits but it is has the discretion to do so is also squarely in conflict with *NRDC*. See U.S. Br. at 20.

Alternatively, EPA asserts that "the intake and discharge of water are closely associated with one another." U.S. Br. at 20. Respondents decline to circle the wagons and instead contradict EPA. See, *e.g.*, Riverkeeper Br. at 1 ("Section 316(b) is the only provision in the statute that regulates water *withdrawals*, as opposed to *discharges*") (emphases in original). And even EPA seems of two minds. See U.S. Br. at 2–3 (section 316(b) "is unique among

CWA provisions in that it addresses the *intake* of water, in contrast to other provisions that regulate the *discharge* of pollutants") (emphases in original). In any event, no Respondent distinguishes the Fourth Circuit's conclusion that "it is obvious" that section 316(b) requirements are not discharge limitations. See Pet. at 19 (discussing *Va. Elec. & Power Co.* v. *Costle*, 566 F.2d 446, 449 (4th Cir. 1977).

3. Respondents seek to avoid this Court's review of the splits in circuit court authority discussed above by casting doubt on the ultimate merits question in the case. These various merits arguments are not relevant to the issue of cert-worthiness and are in any event meritless.

Respondents assert that because standards set under section 301 apply to existing facilities, section 316(b)'s cross-reference to section 301 necessarily means that revised section 316(b) standards may be imposed on existing facilities. See U.S. Br. at 18–19. As explained in the petition, however, section 301 applies to "all point sources"—*i.e.*, both existing *and new* facilities—pending EPA's issuance of potentially more stringent standards for new facilities under section 306. See Pet. at 16–17 (quoting 33 U.S.C. § 1311(e) (emphasis added)). Given the phrasing of section 316(b)'s operative provision (referring to the "location, design, construction, and capacity" of intake structures) and the CWA's lack of any means to impose new section 316(b) standards on existing facilities, the limited import of section 316(b)'s cross-reference to section 301 is clear: to the extent a category of facilities is still subject to section 301 rather than section 306 regulations, any *new*

facilities in that category must build their intake structures in compliance with section 316(b).

EPA, in discussing NPDES permits, accurately quotes section 402 as requiring that "such discharge will meet * * * all applicable requirements under sections [301 and 306]." U.S. Br. at 20. The agency, however, then immediately paraphrases this language, removing the key reference to discharges so that it reads "further direct[ing] that NPDES permits contain all applicable section 301 requirements." *Ibid.* That paraphrase is not a fair representation of the statutory text. Even if section 316(b) requirements are incorporated into sections 301 and 306, it is nonsensical to talk of the *intake* requirements of section 316(b) being "applicable requirements" that a "discharge" must "meet." Furthermore, any suggestion that sections 301 and 306 convert section 316(b) requirements into discharge limitations would conflict with the *Va. Elec.* decision, discussed *supra*.

Lastly, Riverkeeper worries aloud that, if NPDES permits cannot be used to impose new section 316(b) requirements on existing facilities, it "would render section 316(b) meaningless by depriving EPA of a mechanism for imposing its requirements." Riverkeeper Br. at 30. But confirming that NPDES permits to not provide "*a* mechanism" for implementing 316(b) does not, of course, render the entire provision "meaningless." Section 316(b) applies to new facilities, where the pre-construction permitting process of section 401 of the CWA provides for the imposition of "effluent limitations *and other limitations*," including, where appropriate, section 316(b) limitations. See Pet. at 18 (quoting 33 U.S.C. § 1341(d) (emphasis added)). Section 401

demonstrates that where Congress wants to provide regulators authority to implement section 316(b) it uses broad language ("other limitations"); section 402, on the other hand, refers only to discharges and "effluent limitations," and never to "other limitations." See 33 U.S.C. § 1342 (referring to a "discharge" 57 times and "effluent limitations" in 13 places, but never to "other limitations").

4. EPA suggests that Entergy's concerns with the Phase II rulemaking may be resolved on remand to the agency, during which it will reconsider its selection of a "best technology available" ("BTA"). See U.S. Br. at 24. Remand, however, will not address the existing facilities issue, because under a proper reading of the CWA the agency may not impose a new BTA standard on existing facilities *at all*. The proceedings ordered by the Second Circuit will do nothing to ameliorate the *ultra vires* nature of the entire exercise.

In the meantime, as EPA concedes, existing facilities up for renewal of their NPDES permits may be required to undergo costly retrofitting. See Pet. at 20–21; see also U.S. Br. at 9 (decision below "may have significant repercussions for facilities that undergo permitting decisions before the remand proceedings are completed"). As explained in the petition and the briefs of *amici*, if regulators require a nuclear facility to retrofit with cooling towers, it could result in its closure and cost hundreds of millions of dollars, in either case disrupting the nation's electric supply. See, *e.g.*, Pet. at 20.

B. The Cost-Benefit Issue Implicates Further Circuit Splits

Entergy agrees with UWAG and PSEG that, for the reasons given in their reply briefs, the Court should grant certiorari on the cost-benefit issue raised by all three petitions. Entergy writes separately to stress two points.

1. Riverkeeper argues that the Court should defer consideration of the issue pending resolution of a Fifth Circuit case also concerning section 316(b), at which point "any party aggrieved by either circuit's decision [could] seek this Court's review." Riverkeeper Br. at 15–16. That is not so. The Fifth Circuit case concerns "Phase III" facilities, including existing facilities under a certain size threshold. Some entities (such as Entergy) with "Phase II" facilities—larger existing facilities—are petitioners in the case at bar, but not in the Fifth Circuit, and hence could not petition for review from that court. In addition, if industry and EPA win on the cost-benefit issue in the Fifth Circuit, the environmental groups might conclude that they are better off living with something better than half a loaf (application of the Second Circuit's "cost effectiveness test" to the larger Phase II facilities) and thus not seek certiorari. Because EPA and industry, as the (hypothetical) prevailing parties in the Fifth Circuit, would not have standing to petition this Court, the circuit split would be unreviewable. Phase II petitioners, such as Entergy, would have no recourse.

Furthermore, if, for the reasons given above, this Court should grant certiorari on either of the questions pertaining to the existing facilities issue,

there would be no reason for the Court not to consider the cost-benefit issue at the same time.

2. Downplaying the practical impact of the decision below, Riverkeeper accuses Entergy of "hyperbole" in suggesting that the Second Circuit would require the expenditure of billions of dollars to save a single fish larvae. See Riverkeeper Br. at 14. Riverkeeper's sanguine view is possible only by ignoring the court's explanation of its "cost effectiveness" test:

> EPA, given a choice between a technology that costs $100 to save 99–101 fish and one that costs $150 to save 100–103 fish (with all other considerations, like energy production or efficiency, being equal), could appropriately choose the cheaper technology on cost-effectiveness grounds.
>
> * * *
>
> [T]he EPA could not choose the cheaper technology on cost considerations under section 316(b) if the EPA had first determined that the power plants could reasonably bear the cost of technology that could save at least 102 fish.

App. 27a–28a.

Thus, the Second Circuit stated that EPA must under some circumstances require the expenditure of potentially billions of dollars on intake structure technology if it will guarantee the survival of an extra fish or larvae (102 fish versus 99–101 fish). The absurdity of a remand proceeding in which EPA narrowly skirts compromising the nation's electric suppliers as a whole to achieve minute resource

protection differences at the margin underscores the importance of the Court granting certiorari now.

Conclusion

The decision below fosters confusion about the proper scope of deference to EPA and authorizes an untenable expansion of the periodic NPDES permitting provision to embrace, not the discharges that are the Act's focus, but intake structures mentioned only in a provision of the Act that the Second Circuit characterized as a Congressional "afterthought." Pet. App. 5a. Absent this Court's granting certiorari, that "afterthought" will be the new focus of the Act and among the costliest rulemakings is its history. Accordingly, the petition for writ of certiorari should be granted.

Respectfully submitted,

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. Pearl Street
Jackson, MS 39201
(601) 969-2542

ELISE N. ZOLI
Counsel of Record
KEVIN P. MARTIN
GOODWIN PROCTER LLP
53 State Street
Boston, MA 02109
(617) 570-1000

Counsel for Petitioner

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AMICUS CURIAE BRIEF

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In The
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UTILITY WATER ACT GROUP,

Petitioner,

v.

RIVERKEEPER INC., ET AL.,

Respondents.

PSEG FOSSIL LLC and PSEG NUCLEAR LLC,

Petitioners,

v.

RIVERKEEPER INC., ET AL.,

Respondents.

ENTERGY CORPORATION,

Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,

Respondents.

On Petitions For Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

AMICUS CURIAE BRIEF OF THE STATE OF NEBRASKA, ET AL. IN SUPPORT OF UTILITY WATER ACT GROUP

JON BRUNING
Nebraska Attorney General
DAVID D. COOKSON
Chief Deputy
Counsel of Record
2115 State Capitol Building
Lincoln, NE 68509-8920
Tel: (402) 471-2682

Attorneys for Amici Curiae

[Additional Counsel Listed On Inside Cover]

COCKLE LAW BRIEF PRINTING CO. (800) 225-6964
OR CALL COLLECT (402) 342-2831

TROY KING
Attorney General
State of Alabama
11 South Union Street
Montgomery, AL 36130
Tel: (334) 242-7300

DUSTIN MCDANIEL
Arkansas Attorney General
323 Center Street, Suite 200
Little Rock, AR 72201
Tel: (501) 682-1019

STEVE CARTER
Attorney General of Indiana
IGC South, Fifth Floor
302 W. Washington St.
Indianapolis, IN 46204
Tel: (317) 232-6201

PAUL J. MORRISON
Attorney General
State of Kansas
JARED S. MAAG
Deputy Solicitor General
Office of the Kansas
Attorney General
120 Southwest Avenue,
2nd Floor
Topeka, KS 66612
Tel: (785) 296-7972

GREGORY D. STUMBO
Commonwealth of Kentucky
Attorney General
DENNIS G. HOWARD, II
DOUGLAS SCOTT PORTER
LAWRENCE W. COOK
Assistant Attorneys General
1024 Capital Center Drive
Suite 200
Frankfort, KY 40601-8204
Tel: (502) 696-5453

CHARLES C. FOTI, JR.
Attorney General
State of Louisiana
P.O. Box 94005
Baton Rouge, LA 70804
Tel: (225) 326-6705

MICHAEL A. COX
Michigan Attorney General
525 W. Ottawa Street
P.O. Box 30212
Lansing, MI 48909
Tel: (517) 373-1124

WAYNE STENEHJEM
Attorney General of
North Dakota
600 E. Boulevard Avenue
Bismarck, ND 58505-0040
Tel: (701) 328-2210

ROBERT E. COOPER, JR.
Attorney General
State of Tennessee
425 5th Avenue
P.O. Box 20207
Nashville, TN 37202-0207
Tel: (615) 532-2586

GREG ABBOTT
Attorney General of Texas
P.O. Box 12548
Austin, TX 78711-2548
Tel: (512) 463-2100

ROBERT F. MCDONNELL
Attorney General
WILLIAM E. THRO
State Solicitor General
Office of Attorney General
Robert F. McDonnell
900 East Main Street
Richmond, VA 23219
Tel: (804) 786-2436

RAYMOND S. FRANKS II
General Counsel
WEST VIRGINIA DEPARTMENT
OF ENVIRONMENTAL
PROTECTION
601 57th Street SE
Charleston, WV 25304
Tel: (304) 926-0499, ext. 1641

QUESTIONS PRESENTED

Whether the Second Circuit erred by holding that § 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b) prohibits the United States Environmental Protection Agency ("EPA") from considering the cost of a technology in comparison to the level of control it achieves and to the environmental "benefit" of that level of control?

Whether § 316(b) prohibits EPA from authorizing existing facilities to use restoration measures that, taken collectively with the existing characteristics of the cooling water intake structure, ensure that the intake structure minimizes "adverse environmental impact"?

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INTEREST OF AMICI[1]

The interests of the states are twofold. First, the States are the primary permitting authority under the Clean Water Act and have a compelling interest in ensuring consistency in application of environmental regulations. The lower court decision has created a conflict among the Circuits and created uncertainty in the application of § 316(b) of the Clean Water Act. 33 U.S.C. § 1326(b). The States need resolution of the circuit conflict before they can resolve numerous complicated and costly permit applications. The states also need the reaffirmation of the decades-long practice of using "restoration" under § 316(b) consistent with how that term is utilized under numerous other federal programs

Second, the states have a critical interest in preserving the efficacy of a program that, in the limited circumstances in which it is allowed, provides greater environmental benefits to the affected ecosystems than the narrow impingement/entrainment focus adopted by the lower court. If, as the Second Circuit held, states may not consider restoration, then a demonstrated, successful tool for ecosystem restoration will be unavailable to states. The granting of a National Pollution Discharge Elimination System ("NPDES") permit does not occur in a vacuum. The benefits of a coordinated and cooperative ecosystem

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[1] The parties were notified ten days prior to the due date of this brief of the intention to file.

restoration between the federal government, states and stakeholders (including power plant operators) will be lost as a key player—power plants with cooling water intakes—will be removed from the equation.

REASONS FOR GRANTING THE PETITION

The petition should be granted for two reasons. First, this Court should grant review to remove the barrier created by the Second Circuit decision prohibiting implementation of a sound public policy of national importance. Second, this Court should grant review to resolve a conflict among the Circuits.

I. THE SECOND CIRCUIT DECISION BARS IMPLEMENTATION OF A SOUND PUBLIC POLICY OF NATIONAL IMPORTANCE.

The limited use of restoration allowed under § 316(b) of the Clean Water Act is an important public policy. Restoration is consistent with the public policy underlying § 316(b) as it allows for the minimization of adverse environmental impact. It is also consistent with the national policy favoring restoration of aquatic resources, embodied in a host of federal statutes and programs including § 404 of the Clean Water Act, federal highway programs, agricultural programs, natural resources damage restorations provisions under Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), the

Pick-Sloan Act and all of the significant Water Resources Development Acts of the last three decades, including the Water Resources Development Act of 2007, Pub. Law 110-114.

Restoration projects are those that improve fish habitat, encourage fish spawning, or otherwise increase the supply of desirable fish, such as programs to stock water bodies with fish produced in hatcheries. Since the beginning of the modern Clean Water Act in 1972, EPA has interpreted § 316(b) to involve assessing existing intakes and the need for changes to those intakes based on consideration of the effects of the intake and its alternatives to the water body, and the environment, as a whole. Using this approach, EPA and the states have approved a number of restoration projects to help satisfy § 316(b).

This Court should grant review because the Second Circuit decision bars implementation of a key component of the national policy of restoration of aquatic resources. The decision illogically narrows our nation's focus from exploring options to restore surrounding ecosystems to focusing on only the impacts experienced by the specific fish, eggs and larvae impinged and entrained. In addition, by requiring compliance to be strictly based upon the performance standard and alterations to the existing intake characteristics, the decision limits the states' ability to choose the best or most effective alternatives for minimizing adverse environmental impact to the entire ecosystem affected by the permit applicant.

This Court should grant review to allow the limited use of restoration under § 316(b) as a key component of a systemic legislative intent. Restoration is consistent with the larger legislative scheme of Congress to encourage ecosystem restoration when and wherever possible. It is implausible to suggest that it was Congress' intent to prohibit the use of restoration under § 316(b), when Congress and the Executive Branch have approved or mandated restoration for almost every other program that impacts rivers, streams and water bodies.

There are numerous examples in statute and application where restoration is mandated or allowed. The Clean Water Act, itself, and the numerous Water Resources Development Acts provide the clearest guidance to the national import of including restoration as an option under § 316(b). One of the objectives of the Clean Water Act is to "restore . . . the . . . biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). One of the Act's fundamental policies is to protect the rights of states to plan the development and use (including restoration, preservation, and enhancement) of land and water resources. 33 U.S.C. § 1251(b). The National Environmental Policy Act requires EPA to use "all practicable means" to enhance the quality of renewable resources (42 U.S.C. § 4331(b)(6)) and to develop "to the fullest extent possible . . . appropriate alternatives" to recommended courses of action (42 U.S.C. § 4332(2)(E)). Likewise, § 404 of the Clean Water Act has long been interpreted to include restoration as a feature of that section's permit program. The § 404(b)(1) guidelines

promulgated in 1980 provide that "[h]abitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat." 40 C.F.R. 230.75(d)

Recently Congress passed, notwithstanding the objections of the President, the Water Resources Act of 2007, Pub. Law 110-114. Among the projects authorized was a comprehensive ecosystem restoration effort within the Missouri River basin, including multiple federal agencies, states, tribes and stakeholders. (Section 5018, Pub. Law 110-114). The Missouri River basin is home to numerous power plants that obtain the cooling water necessary to their operation from the Missouri River or its tributaries within the ten states that makeup the basin. Allowing the Second Circuit decision to stand would create the illogical result of removing the cooling water intake permitting decisions for these plants from the comprehensive efforts underway by removing the opportunity to use and coordinate restoration activities.

The Supreme Court should grant review because the Second Circuit decision unnecessarily reduces the choices states have in addressing site specific ecosystem restoration decisions. Most, if not all, of the 50 states have a public policy of protecting and enhancing wetlands and aquatic habitat. Each affected ecosystem has unique concerns that must be addressed in order to meet the goals of the Clean Water Act. The flexibility to accept restoration in lieu of, or together with, changes to the existing intake equipment and an operational restriction is necessary to

give the states the greatest opportunity to "minimize adverse environmental impact" at all sites.

In the view of the amici states, it is not likely that Congress intended that restoration be allowed under several federal programs, including § 404 of the Clean Water Act, but be forbidden under only one—§ 316(b). For these reasons, the amici states respectfully request that the Supreme Court grant the writ of certiorari.

II. THE SECOND CIRCUIT DECISION CONFLICTS WITH THE LONG-STANDING DECISION OF THE FIRST CIRCUIT.

The decision of the Second Circuit to reject cost benefit analysis and restoration under Phase II of the permitting process directly conflicts with the First Circuit's approval of EPA's long-standing interpretation of § 316(b), which allows for the use of both. *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306 (1st Cir. 1979). Examples of the direct conflict between the two Circuits' decisions can be found at pages 10-11 and 21-22 of the Utility Water Act Group's petition for certiorari and pages 32-37 of the PSEG Fossil LLC and PSEG Nuclear LLCs' petition for certiorari.

It is imperative that this conflict be resolved because the amici states, like EPA and other states, have relied on *Seacoast* to allow for cost/benefit in making permit decisions. The Second Circuit's divergence from the longstanding interpretation of

§ 316(b), leaves the states in the precarious position of continuing to follow *Seacoast* or revisiting permitting determinations at a great cost and expense to the states, the permit applicants and the consumers who are dependent on the power produced by the plants in question.

Absent resolution by this Court, the states will have to reevaluate and reissue dozens of permits, each involving millions of dollars in infrastructure development by the permit applicants, which the states only recently reissued with conditions based on the Phase II rule adopted by EPA. For both those permits and for permits still pending reissuance, states will have to decide whether or not they may continue to do a cost benefit analysis and apply the wholly disproportionate test. The states will have to determine how to treat facilities that have spent millions of dollars on compliance strategies that include restoration. This will only further burden what are already overstrained state resources. Likewise, the increased costs will substantially increase already inflated energy prices, further taxing a precariously positioned national economy.

Absent the ability to use a cost benefit analysis, none of these increased costs and impacts will be justified by any determination of corresponding benefits to the ecosystem and species affected by cooling water intakes. The inability to use restoration will result in missed opportunities to make broader, more permanent improvements in the aquatic and terrestrial ecosystems. Inevitably, the uncertainty

created by the split between the First and Second Circuits, combined with the adverse consequences of following the Second Circuit's approach, will spawn needless litigation and further delay, which states and their citizens can ill afford.

CONCLUSION

For the reasons stated above, the amici states request this Court grant the petitions for certiorari.

Respectfully submitted,

JON BRUNING
Nebraska Attorney General
DAVID D. COOKSON
Chief Deputy
Counsel of Record
2115 State Capitol Building
Lincoln, NE 68509-8920
Tel: (402) 471-2682

TROY KING
Attorney General
State of Alabama
11 South Union Street
Montgomery, AL 36130
Tel: (334) 242-7300

DUSTIN MCDANIEL
Arkansas Attorney General
323 Center Street, Suite 200
Little Rock, AR 72201
Tel: (501) 682-1019

STEVE CARTER
Attorney General of Indiana
IGC South, Fifth Floor
302 W. Washington St.
Indianapolis, IN 46204
Tel: (317) 232-6201

PAUL J. MORRISON
Attorney General
State of Kansas
JARED S. MAAG
Deputy Solicitor General
Office of the Kansas
Attorney General
120 Southwest Avenue,
2nd Floor
Topeka, KS 66612
Tel: (785) 296-7972

GREGORY D. STUMBO
Commonwealth of Kentucky
Attorney General
DENNIS G. HOWARD, II
DOUGLAS SCOTT PORTER
LAWRENCE W. COOK
Assistant Attorneys General
1024 Capital Center Drive
Suite 200
Frankfort, KY 40601-8204
Tel: (502) 696-5453

CHARLES C. FOTI, JR.
Attorney General
State of Louisiana
P.O. Box 94005
Baton Rouge, LA 70804
Tel: (225) 326-6705

MICHAEL A. COX
Michigan Attorney General
525 W. Ottawa Street
P.O. Box 30212
Lansing, MI 48909
Tel: (517) 373-1124

WAYNE STENEHJEM
Attorney General of
North Dakota
600 E. Boulevard Avenue
Bismarck, ND 58505-0040
Tel: (701) 328-2210

ROBERT E. COOPER, JR.
Attorney General
State of Tennessee
425 5th Avenue
P.O. Box 20207
Nashville, TN 37202-0207
Tel: (615) 532-2586

GREG ABBOTT
Attorney General of Texas
P.O. Box 12548
Austin, TX 78711-2548
Tel: (512) 463-2100

ROBERT F. MCDONNELL
Attorney General
WILLIAM E. THRO
State Solicitor General
Office of Attorney General
Robert F. McDonnell
900 East Main Street
Richmond, VA 23219
Tel: (804) 786-2436

RAYMOND S. FRANKS II
General Counsel
West Virginia Department
of Environmental
Protection
601 57th Street SE
Charleston, WV 25304
Tel: (304) 926-0499, ext. 1641

Attorneys for Amici Curiae

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v.

RIVERKEEPER, INC., ET AL.

UTILITY WATER ACT GROUP

v.

RIVERKEEPER, INC., ET AL.

ON PETITIONS FOR A WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

**BRIEF FOR THE
NUCLEAR ENERGY INSTITUTE
AS AMICUS CURIAE SUPPORTING PETITIONERS**

ELLEN C. GINSBERG
MICHAEL A. BAUSER
NUCLEAR ENERGY
INSTITUTE
1776 I Street, N.W.
Washington, D.C. 20006
(202) 739-8000

SETH P. WAXMAN
Counsel of Record
EDWARD C. DUMONT
BRIAN M. BOYNTON
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Ave., N.W.
Washington, D.C. 20006
(202) 663-6000

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INTEREST OF AMICUS CURIAE

The Nuclear Energy Institute (NEI) represents the commercial nuclear energy industry on regulatory matters.[1] NEI's members include every entity licensed by the Nuclear Regulatory Commission to generate electricity at a commercial nuclear power plant in the United States. Members also include nuclear plant designers, major architecture and engineering firms, fuel fabrication facilities, and other organizations and individuals involved in the nuclear energy industry.

The court of appeals' interpretation of Section 316(b) of the Clean Water Act in this case will have a significant impact on most, if not all, of the 38 U.S. nuclear power plants that do not currently use "closed-cycle" cooling water systems. NEI can offer the Court an informed perspective on the likely practical consequences of the court of appeals' decision.

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[1] No counsel for a party authored this brief in whole or in part, and no party or its counsel made a monetary contribution intended to fund the preparation or submission of this brief. Petitioners PSEG Nuclear LLC and Entergy Corporation, and certain members of petitioner Utility Water Act Group with nuclear plants, are members of NEI and make contributions that support all of NEI's activities, including the filing of amicus briefs. No person other than NEI, its members, or its counsel made a monetary contribution to the preparation or submission of this brief. Counsel of record for all parties received timely notice of NEI's intent to file this brief, and letters from all parties consenting to the filing of this brief have been submitted to the Clerk.

INTRODUCTION AND SUMMARY OF ARGUMENT

The petitions for a writ of certiorari should be granted because the court of appeals has misconstrued the Clean Water Act in a way that is likely to cause significant reductions in the nation's supply of nuclear power in the near and medium term. The court's decision thus poses a substantial threat to the sufficiency of the nation's electric power supply, to the stability of the electric power grid—and, perversely, to the very environmental values that the Clean Water Act and similar statutes are designed to protect.

Refusing to defer to the EPA's longstanding interpretation of its statutory mandate, the court of appeals has read Section 316(b) of the Clean Water Act to foreclose the agency from comparing incremental costs and benefits in determining what is, under particular circumstances, "the best technology available for minimizing [the] adverse environmental impact" caused by cooling water intake structures. The court's reasoning may require the EPA to mandate that all of the nation's 38 nuclear power plants that now use "once-through" cooling be retrofitted to use "closed-cycle" systems. Some plants, however, would likely find it either physically or economically impossible to comply with such a mandate, and would shut down. Others would incur exceptional costs and be unable to produce power for up to a year as they retrofit their systems. In addition, every facility that switches to a closed-cycle system will suffer a significant "energy penalty"—a permanent decrease in generating capacity.

Already, the supply of energy in the United States barely keeps pace with, and sometimes falls below, demand. In the near term, capacity margins will only get

tighter. Because the output of nuclear plants is large and constant, nuclear power plays a particularly important role in maintaining the nation's baseload power supply. Reducing the supply of nuclear power would have a disproportionately adverse effect on both the adequacy of the amount of power supplied to, and the stability of, the power grid.

Substantial time is required to secure approval for and to construct new nuclear plants. If existing nuclear plants are forced to close, either temporarily or permanently, in the near and medium term their power output could realistically be replaced only by plants that burn fossil fuels. Unlike nuclear plants, fossil-fuel plants produce greenhouse gases that are believed by many to contribute to global climate change. That would be, to say the least, an ironic result of overreading Section 316(b) to require the retrofitting of cooling systems even where the EPA or responsible state officials—not plant owners—would otherwise conclude that the costs involved are wholly disproportionate to any environmental benefit that might be achieved.

All this might be beside the point if, as the court of appeals held, Section 316(b) were so clear on its face as to leave no room for construction by the EPA. As petitioners demonstrate, however, that is not the case. To the contrary, the court of appeals adopted facially unreasonable limits on the sensible flexibility that Congress conferred here, as it typically does, on the expert agency it relies on to interpret and administer a broad statutory mandate. That error threatens very serious consequences, and it merits this Court's review.

ARGUMENT

I. NUCLEAR POWER PROVIDES A CRITICAL PORTION OF THE NATION'S ENERGY SUPPLY, PARTICULARLY IN LIGHT OF CLIMATE CHANGE

The supply of power in the United States is under strain. At times, supply in some areas can barely meet demand. During the summer of 2006, for example, a heat wave "required utility system operators, customers, and government agencies to implement emergency procedures in some areas." North American Electric Reliability Corporation (NERC), *2006 Long Term Reliability Assessment: The Reliability of Bulk Power Systems in North America* 5 (Oct. 2006), *available at* http://www.nerc.com/~filez/rasreports.html.[2] Blackouts were avoided principally "because generating capacity performed extremely well during this period." *Id.*

The problem is likely to get worse before it gets better. Over the next ten years, the utility industry expects peak demand to increase by over 17%, while committed generating capacity is expected to increase by only 8.4%. NERC, *2007 Long Term Reliability Assessment: The Reliability of Bulk Power Systems in North America* 10 (Oct. 2007) (2007 NERC Assessment), *available at* http://www.nerc.com/~filez/rasreports.html. In a number of regions, capacity margins are expected to drop well below target levels. *Id.* at 24.

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[2] NERC is the entity certified by the Federal Energy Regulatory Commission as the single "Electric Reliability Organization" for the United States under Section 215 of the Federal Power Act, 16 U.S.C. § 824o(c). *See Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing*, 116 FERC ¶ 61,062 (July 20, 2006).

Against this backdrop, nuclear power plants are an exceedingly important source of power. There are currently 104 operating units at more than 60 nuclear plants in the United States. These plants generate approximately 20% of the nation's electricity.[3] Along with coal and natural gas, nuclear energy is a foundational part of the nation's power supply.

Nuclear power is a particularly important source of generation because of its cost stability and output reliability. The supply and cost of nuclear power do not fluctuate significantly based on weather or climate conditions, fuel cost variability, or the vagaries of foreign suppliers. Nuclear plants are able to operate without interruption for extended periods, up to 24 months at a time. Because nuclear power can be so reliably generated, it helps supply the "baseload" of electricity that is required for the national electric power grid to function. Indeed, the stability of the grid depends on nuclear power.

Nuclear energy is also comparatively inexpensive. Nuclear plants are currently estimated to be the lowest-cost producers of baseload electricity.[4] The consistent availability of nuclear power at predictable prices

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[3] *See* Comments of the Nuclear Energy Institute, Comment ID 316bEFR.020.002, at 407. The comments cited in this brief are available at http://www.epa.gov/waterscience/316b/phase2/comments/author-ph2.pdf. The page citations provided are to this compilation of the comments.

[4] *See Status and Outlook for Nuclear Energy in the United States* 3-4 (Aug. 2006), *available at* http://nei.org/resourcesandstats/documentlibrary/reliableandaffordableenergy/reports/statusreportoutlook/.

also has a stabilizing effect on the electricity market as a whole.

Finally, nuclear power is increasingly cited as an important part of efforts to minimize adverse environmental impacts. As this Court has recognized, the world faces serious threats from global climate change. *See Massachusetts* v. *EPA*, 127 S. Ct. 1438, 1455 (2007). Many believe that climate change is caused in significant part by the emission of greenhouse gases, including carbon dioxide. Nuclear plants emit no such gases. For that reason, the United Nations Intergovernmental Panel on Climate Change, which recently shared the Nobel Peace Prize for its work on global warming, listed "nuclear energy" in its recently released Fourth Assessment Report as a "key" technology for mitigating greenhouse gas emissions—a technology, importantly, that is "currently commercially available."[5]

This point has concrete application in the United States today. Nuclear power plants—not solar or wind or other "alternative" energy sources—generate some

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[5] *See Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report* 17 (Nov. 16, 2007 draft), *available at* http://www.ipcc.ch/; *see also Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* 269 (Cambridge Univ. Press 2007), *available at* http://www.mnp.nl/ipcc/pages_media/AR4-chapters.html ("Total life-cycle [greenhouse gas] emissions per unit of electricity produced from nuclear power are . . . similar to those for renewable energy sources. Nuclear power is therefore an effective [greenhouse gas] mitigation option, especially through license extensions of existing plants enabling investments in retro-fitting and upgrading." (citations omitted)).

71% of all carbon-free electricity in America.[6] Increased electricity production by nuclear power plants is responsible for one-third of all reductions of carbon emissions by U.S. industry since 1993 as part of the Department of Energy's Climate Challenge and Climate Vision programs. Using nuclear power instead of fossil-fuel-burning power plants prevents almost 700 million metric tons of carbon dioxide emissions. For perspective, the volume of greenhouse gas emissions prevented by the use of nuclear power in the United States is equivalent to taking more than 90% of all passenger cars off the nation's roadways.

II. THE COURT OF APPEALS' DECISION COULD FORCE RETROFITTING AT EXISTING NUCLEAR PLANTS, EVEN IF INDEPENDENT REGULATORS WOULD OTHERWISE CONCLUDE THAT COSTS WHOLLY OUTWEIGH BENEFITS

Section 316(b) of the Clean Water Act directs the EPA, in establishing discharge standards under Sections 301 and 306 of the Act, to "require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). In applying that provision to existing power plants, the EPA concluded that it could and should compare the costs of adopting particular technologies to their expected incremental benefits. *See National Pollutant Discharge Elimination System—Final Regulations To Establish Requirements for Cooling Water Intake Structures at Phase II Existing*

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[6] The factual points in this paragraph are drawn from a more detailed discussion, *Environment: Emissions Prevented*, available on NEI's website at http://www.nei.org/resourcesandstats/nuclear_statistics/environmentemissionsprevented/.

Facilities, 69 Fed. Reg. 41,576, 41,576, 41,583 (July 9, 2004) (Phase II Rulemaking). This conclusion was in keeping with the EPA's 30-year history of taking costs and benefits into account in determining under Section 316(b) what was the "best technology available" for large power plants—including the plants approved and constructed during that period, which are now "existing facilities" subject to the Phase II regulations.

Accordingly, the EPA decided that existing plants should not be required to adopt closed-cycle cooling, even though that was the "best technology available" for *new* plants, because the cost considerations are radically different. *See* 69 Fed. Reg. at 41,605-41,606. Likewise, the agency concluded that a facility could seek special determination of the "best technology available" at a particular site "by demonstrating . . . that its costs would be significantly greater than the benefits of complying with [the generally applicable] performance standards at the facility." *Id.* at 41,603.

The court of appeals held that the text and structure of the Clean Water Act foreclose the EPA's approach. *See Riverkeeper, Inc.* v. *EPA*, 475 F.3d 83, 98-99, 114 (2d Cir. 2007). As petitioners PSEG, UWAG, and Entergy demonstrate, that is incorrect. *See* PSEG Pet. 17-27; UWAG Pet. 16-28; Entergy Pet. 25-35. We do not repeat the entire analysis here. We do note. however, that the court of appeals' reasoning is at war even with itself.

The court recognized that the word "available" is capacious enough to permit rejection of a technology so expensive that its cost could not be "reasonably borne" by "the industry" as a whole. *See* 475 F.3d at 99. The court never explained exactly what it meant by "the industry" bearing costs, but the formulation suggests

that the court would accept that a technology is not "available" if implementing it would be cost-prohibitive for a sufficient number of individual firms and their customers. If the statute can bear that meaning, it can also bear the interpretation adopted by the EPA—in effect, that a technology is not the "best technology available" in any particular instance if, under all the circumstances, the particular plant operator involved cannot reasonably be asked to bear the cost of implementing it. While the court of appeals preferred to draw the "availability" line in one place rather than the other, once it conceded that there was a line to be drawn, the specific placement was not its decision to make. *See Chevron U.S.A. Inc.* v. *Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-843 (1984).

Similarly, the court of appeals purported to draw support for its interpretation of Section 316(b) from other sections of the Clean Water Act. 475 F.3d at 97-98. But the provisions upon which the court relied expressly permit EPA to consider "such other factors as [it] deems appropriate," 33 U.S.C. § 1314(b)(2)(B), as well as "the cost of achieving [the] effluent reduction," *id.*; *id.* § 1316(b)(1)(B). Rather than support the court of appeals' decision, these provisions confirm its error.

The court of appeals stopped short of expressly ordering the EPA to mandate retrofitting of all existing plants to use closed-cycle cooling. Respondents, however, will no doubt argue that the court's reasoning requires that result. *See* 475 F.3d at 102 (stating that the court's "concern with the EPA's determination with respect to section 316(b) is further deepened by the Agency's rejection of closed-cycle cooling and selection of a suite of technologies as the basis for BTA"); *id.* at 103 & n.16 (expressing doubt as to whether a suite of technologies could "approach[] the performance of

closed-cycle cooling" (internal quotation marks omitted)); *id.* at 105 (remanding "for clarification . . . and possibly for a new determination of BTA"). The EPA may feel constrained to agree. Because the court of appeals expressly read Section 316(b) to prohibit any use of restoration methods, *id.* at 108-110, that approach will no longer be available on remand. In light of the court of appeals' severe limitation on the EPA's ability to consider costs, closed-cycle cooling may be the only technological solution left open to the agency.

The EPA has already determined that retrofitting plants to use closed-cycle cooling generally will reduce impingement and entrainment to a greater degree than upgrading the design and construction of water intake structures at once-through plants. *See* 69 Fed Reg. 41,576, 41,606.[7] While the reductions achievable using other technologies "approach[]" those from closed-cycle cooling, respondents will surely argue that they are not "essentially the same" in the only sense that the court of appeals would recognize as allowing selection of the lower-cost alternative. *See* 475 F.3d at 100-101. If that is correct, the court's decision will require the EPA to mandate retrofitting of all existing plants to use closed-cycle cooling, so long as the billions of dollars that retrofitting would cost could theoretically be borne by the industry as a whole.

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[7] The EPA determined that "closed-cycle, recirculating cooling systems (e.g., cooling towers or ponds) can reduce mortality from impingement by up to 98 percent and entrainment by up to 98 percent when compared with conventional once-through systems" in fresh water. *Id.* at 41,601. In contrast, the EPA's performance standards contemplating adoption of other technologies called for reduction of impingement "by 80 to 95 percent" and reduction of entrainment "by 60 to 90 percent." *Id.* at 41,598.

III. Mandating Use Of Closed-Cycle Cooling At Existing Nuclear Plants Would Have Significant Adverse Effects On The Nation's Power Supply—And On The Environment

The Phase II regulations struck down by the court of appeals cover all 104 nuclear power units currently in operation in the United States. Sixty-one of those units currently use once-through cooling. If all existing plants are required to convert to closed-cycle cooling, some will likely close entirely, and all will be subject to temporary closures of up to a year and suffer permanent decreases in net generating capacity. These closures and losses in efficiency would significantly diminish the nation's supply of nuclear power, contributing to shortfalls in generation, grid instability, and environmental harm. In part for these reasons, the Department of Energy "strongly" recommended to the EPA during the Phase II rulemaking that it "not include any requirement that has the effect of forcing any class of facilities to install wet [closed-cycle] cooling towers." Comments of Department of Energy, Comment ID 316bEFR.010.028, at 185.

A. Mandating That Existing Plants Be Retrofitted To Use Closed-Cycle Cooling Would Reduce The Nation's Supply Of Nuclear Power

Retrofitting existing nuclear plants to use closed-cycle cooling is at best a complicated, costly, and time-consuming process, and may not be possible or economically feasible at some plants. Closed-cycle cooling requires the construction of large towers to re-cool the water between cycles. Just finding the space for these towers is a significant challenge for many plants. In rejecting mandatory closed-cycle retrofits, the EPA noted that "31 out of 56 plants surveyed said that they would need to acquire additional property to accommo-

date cooling towers." 69 Fed. Reg. at 41,605. Even leaving aside cost, the agency recognized that there may be significant impediments to the acquisition and development of that additional land. *Id.*

To begin with, in some locations, especially in urban areas, it may be difficult or impossible to obtain sufficient vacant or clearable land adjacent to the existing plant site. 69 Fed. Reg. at 41,605. Moreover, even where land is nominally available, developing it for cooling-tower use may present daunting challenges. For example, retrofitting the Diablo Canyon plant on the central California coast, if it could be done at all, would require excavating a 1600-foot by 600-foot section of the Las Cañadas coastal hills adjacent to the plant to make room for the construction of 132 60-foot-tall water tower cells.[8] Retrofitting the San Onofre Nuclear Generating Station, on the coast between San Diego and Los Angeles, likely would require construction of cooling water tanks at the top of 100-foot bluffs overlooking the beach adjacent to the plant.

If the land necessary for cooling towers could be obtained, a plant owner would need to acquire federal, state, and possibly local permits to proceed with retrofitting. For example, some retrofits would require a license amendment from the Nuclear Regulatory Commission, which requires a formal approval process generally involving public hearings. *See* 10 C.F.R. § 50.91.[9]

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[8] Unless otherwise indicated, examples in this brief are drawn from information provided by plant operators.

[9] A license amendment is required if a proposed change to a nuclear plant involves, among other things, a modification to technical specifications. *See* 10 C.F.R. § 50.59(c)(1)(i). Whether retro-

Obtaining such amendments would consume substantial public and private resources. This would occur at a time when the Commission and industry are concentrating on applications to renew operating licenses at existing nuclear plants and on licensing and constructing new plants that are necessary to meet the expanding demand for power.

Ironically, efforts to obtain the permits necessary to address what the court of appeals viewed as the fish-protection requirements of the Clean Water Act could well be hampered by adverse environmental impacts of other sorts that might result from retrofitting plants to use closed-cycle cooling. For example, salt-water cooling towers produce large plumes of salt water vapor that can contribute to fogging and icing in the surrounding area and affect nearby electrical equipment. One may anticipate concern about increased noise. The prospect of extensive construction in sensitive areas, such as around the coastal Diablo Canyon and San Onofre plants, would raise substantial concerns that could delay or even preclude obtaining necessary approvals. As the EPA noted, for example, expanding some plants might require displacement of ecologically valuable wetlands. 69 Fed. Reg. at 41,605. Similarly, the San Onofre plant is surrounded by federal and state lands that support species protected by state and federal laws.

Apart from land and permits, retrofitting large existing plants to use closed-cycle cooling would be a significant engineering challenge. Among other things, closed-cycle cooling requires an extensive network of

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fitting to use closed-cycle cooling would require a license amendment would be a plant-specific determination.

pipes to circulate water to and from the plant's condensers. For example, it is estimated that retrofitting the Salem Generating Station to use closed-cycle cooling would require the demolition or abandonment of over three miles of existing 7-foot and 10-foot diameter circulating pipe and the installation of over 4 miles of new 7-foot pipe. *See, e.g.*, Comments of UWAG, Comment ID 316bEFR.041.351, at 1330. Additionally, many plants would need to reinforce their condensers to withstand the increased pressure resulting from closed-cycle cooling and otherwise modify them for use with the retrofitted system.

For all these reasons, where retrofitting nuclear plants to use closed-cycle cooling is possible at all, it would be very—sometimes prohibitively—expensive. As the EPA concluded:

> [A] national requirement to retrofit existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable. EPA estimates that the total capital costs for individual high-flow plants (i.e., greater than 2 billion gallons per day) to convert to wet towers generally ranged from $130 to [illegible]00 million, with annual operating costs in the range of $4 to $20 million . . . .

69 Fed. Reg. at 41,605.

Indeed, the EPA recognized that, for a variety of reasons, its substantial cost estimates "may not fully reflect the costs of the option." 69 Fed. Reg. at 41,605. Consistent with that recognition, forecasts by individual plant operators run even higher. The Edison Electric Institute, the association of U.S. shareholder-owned electric companies, has estimated that retrofit-

ting the 38 existing once-through nuclear plants with closed-cycle cooling would cost between $10 billion and $19 billion.[10] Estimates of the cost of retrofitting all existing once-through plants with closed-cycle cooling submitted to the EPA by petitioner UWAG ranged from $40 to $66 billion. *See* UWAG Pet. 37. Using the high end of the EEI range, the average cost per nuclear plant would be $500 million. For each of four plants—Diablo Canyon, Salem Generating Station, San Onofre, and Indian Point—EEI or plant owners estimate that the cost of retrofitting could total $1 billion or more. At Diablo Canyon alone, retrofitting could cost in the range of $2.4 billion.

If retrofitting proceeds at any given plant even in the face of these geographical, governmental, environmental, technical, and financial challenges, it can require shutting the plant down for prolonged periods. The EPA estimated that plants would be unavailable for as long as 10 months. *See* 69 Fed. Reg. at 41,605. Private estimates suggest that retrofitting Diablo Canyon and San Onofre would render the plants unavailable for 12 months or more, that Indian Point would be closed for approximately 10 months, and that Oyster Creek would have to be shut down for more than four months. Extended outages would also be anticipated at the Salem facility. *See* PSEG Pet. 34 (estimating that a closed-cycle retrofit "would require partially suspending operations for at least 14 months, causing a net loss of 1150 megawatts . . . during that period").

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[10] This range is derived from cost estimates submitted to the EPA adjusted with some site-specific cost estimates provided by individual operators.

Finally, once returned to operation, retrofitted plants would produce less usable power than they did before. A steam power plant's condenser "operates under vacuum conditions (i.e. a pressure below normal atmospheric pressure)." Comments of the Department of Energy, Comment ID 316bEFR.010.101, at 239. Because cooling water in once-through systems has on average a lower temperature than water in closed-cycle cooling systems, the vacuum created in once-through systems is greater than in closed-cycle systems, which increases efficiency. *Id.* In addition, closed-cycle systems require more power to run the cooling system itself, leaving less for consumers.

In its Phase II rulemaking, the EPA relied on an estimate by the Department of Energy that the "energy penalty" resulting from converting existing once-through plants to closed-cycle cooling would generally amount to a 2.4% to 4.0% decline in energy production capacity. 69 Fed. Reg. at 41,605. The EPA noted a 5.3% energy penalty associated with the use of closed-cycle cooling for one nuclear plant that provides 78% of the electricity for Vermont. *See id.* Using the same DOE figures relied upon by the EPA, it has been estimated that retrofitting all existing nuclear plants to use closed-cycle cooling would reduce overall capacity by 2,117 megawatts. As the EPA explained with respect to both nuclear and non-nuclear plants, "on average 20 additional 400-MW plants might have to be built to replace the generating capacity lost by replacing once-through cooling systems with wet cooling towers if such towers were required by all Phase II facilities." *Id.*

In short, if the court of appeals' decision stands and requires the EPA to mandate retrofitting of closed-cycle cooling at all existing nuclear power plants, some

of those plants will likely find it physically or economically impossible to continue operation, and all will face temporary closures and permanent reductions in generating capacity. Either way, requiring retrofitting would significantly reduce the nation's supply of nuclear energy.

B. Reducing The Supply Of Nuclear Power Will Have Substantial Adverse Effects Both On The Energy Supply And On The Environment

The reduction in capacity caused by mandating retrofitting of existing nuclear plants will have a number of significant adverse impacts.

First, even if all plants ultimately remain in operation, the significant energy penalty caused by the use of closed-cycle cooling would by itself have a significant adverse impact on the power supply. While the lost capacity could eventually be replaced, in the short term air quality limitations would likely prevent fossil-fuel plants from meeting the entire shortfall, and existing nuclear plants lack additional capacity. In areas of the country already facing energy constraints, such as California and the mid-Atlantic/Northeast corridor, the near-term reduction in capacity would increase the likelihood of brownouts and blackouts during the summer months.

Loss of the power generated by nuclear plants that are forced to close would substantially exacerbate the problem. For example, in its comments to the EPA, petitioner Entergy estimated that if its Indian Point nuclear plant were to close, target reserve margins in New York could not be met and "the calculated number of days where emergency measures would be taken to prevent blackouts, etc., would rise by 800%." Comments of Goodwin Procter (submitted on behalf of En-

tergy Corp.), Comment ID 316bEFR.029.035, at 619. Even temporary plant closures to allow retrofitting would have a significant impact. Because of their length, the anticipated closures would likely overlap with the winter or summer peak electricity demand seasons, threatening the reliability of the power grid.

NERC has recognized that mandating closed-cycle cooling could adversely affect the nation's power capacity margins In its 2007 reliability report, NERC explained:

> While plant specific outcomes will vary, retrofitting existing power plants with cooling towers can reduce the capacity of those plants, which will exacerbate the supply concerns identified in ... this assessment. In some cases, retrofits may prove so costly that plants are retired earlier than projected, with the consequent loss of the plant's entire capacity. At a time when additional electricity generating resources are needed, the loss of existing generating capacity would undermine U.S. efforts to meet the growing demand for electricity.

2007 NERC Assessment at 12. And, as noted above, during the Phase II rulemaking the Department of Energy "strongly" recommended that the EPA not require existing plants to be retrofitted to use closed-cycle cooling. Comments of Department of Energy, Comment ID 316bEFR.010.028, at 185.

Mandating the use of closed-cycle cooling would likely also have significant adverse *environmental* effects. First, as explained above, at some plant sites a closed-cycle retrofit would raise its own substantial environmental issues. In addition to possible adverse effects on the land and air surrounding the plant, retrofit-

ting could even adversely affect the water resources protected by the Clean Water Act itself. Although a closed-cycle cooling system at a nuclear plant does not take in as much water day-to-day as a once-through system, it actually *consumes* (that is, permanently removes from the source water body) up to 80% *more* water overall. *See Water & Sustainability (Volume 3): U.S. Water Consumption for Power Production—The Next Half Century* viii (Elec. Power Research Inst. 2002).

Second, where existing plants are forced to close or have their output cut by retrofitting, new nuclear plants cannot realistically replace the lost power over the short or medium term. Designing a new nuclear plant, obtaining necessary permits, and building the plant takes years. New nuclear projects already in early stages of development are not expected to begin production until 2015 to 2020. Thus, as a practical matter, for at least several years any generating capacity lost from existing nuclear plants would have to be replaced, if at all, by power generated using fossil fuels.

The EPA understood that requiring retrofitting would result in increased reliance on fossil fuels. *See, e.g.*, 69 Fed. Reg. at 41,605. That, in turn, would increase "the emission of sulfur dioxide, NO_x, particulate matter, mercury and carbon dioxide." *Id.* It is estimated that using fossil fuels to replace the nuclear power lost due to the retrofitting energy penalty alone could add 37,000 tons of sulfur dioxide, 13,000 tons of nitrogen oxide, and 14 million metric tons of carbon dioxide to the nation's atmosphere.[11] If capacity lost as a

[11] Carbon dioxide typically is measured in metric tons, which are equivalent to approximately 2205 lbs.

result of nuclear plant closures were also replaced by power from fossil-fuel plants, the increase in greenhouse gas emissions would be even more severe.

* * *

Taking into account all of these concerns, the EPA reasonably concluded that, for existing power plants, the tremendous costs of retrofitting for closed-cycle cooling far outweigh the incremental benefits it provides, as compared to the use of other EPA-approved technologies, in reducing impingement and entrainment at water intake structures. Its judgment rested both on economic costs and on "non-water quality environmental impacts." 69 Fed. Reg. at 41,605.

If Congress had weighed the various competing economic and environmental considerations itself and clearly mandated a different approach, then the court of appeals would have been right to set aside the agency's judgment and enforce the congressional command. As petitioners have demonstrated, however, nothing in the language, structure, purpose, or previous judicial interpretation of the Clean Water Act precludes the EPA from taking economic and environmental costs into account, along with potential benefits, in determining what constitutes, under particular circumstances, the "*best* technology *available* for minimizing adverse environmental impact" under Section 316(b). On the contrary, it is precisely in circumstances such as these, involving the balancing of important social goals that interact in complex ways, that Congress most typically delegates to an agency the responsibility for particularized implementation of statutory standards.

Because the Act, unsurprisingly, leaves room for just the sort of complex agency judgment that the EPA

made here, the court of appeals erred in substituting its own absolutist analysis for the more balanced approach adopted by the EPA. That error threatens real, immediate, and far-reaching harm to the nation's power supply—and, ironically, to the very environmental values that the court no doubt thought it was protecting. It warrants review and correction by this Court.

CONCLUSION

The petitions for a writ of certiorari should be granted.

Respectfully submitted.

ELLEN C. GINSBERG
MICHAEL A. BAUSER
NUCLEAR ENERGY INSTITUTE
1776 I Street, N.W.
Washington, D.C. 20006
(202) 739-8000

SETH P. WAXMAN
Counsel of Record
EDWARD C. DUMONT
BRIAN M. BOYNTON
WILMER CUTLER PICKERING HALE AND DORR LLP
1875 Pennsylvania Ave., N.W.
Washington, D.C. 20006
(202) 663-6000

DECEMBER 2007

JOINT APPENDIX

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Supreme Court, U.S.
FILED
JUL 14 2008
OFFICE OF THE CLERK

Nos. 07-588, 07-589, 07-597 (Consolidated)

In the
Supreme Court of the United States

ENTERGY CORP., *Petitioner*,
v.
ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,
v.
RIVERKEEPER, INC., ET AL., *Respondents*.

UTILITY WATER ACT GROUP, *Petitioner*,
v.
RIVERKEEPER, INC., ET AL., *Respondents*.

On Writs Of Certiorari To The United States Court Of Appeals For The Second Circuit

JOINT APPENDIX

RICHARD J. LAZARUS
Counsel of Record
GEORGETOWN UNIVERSITY
LAW CENTER
600 NEW JERSEY AVE., NW
WASHINGTON, DC 20001
(202) 662-9129
lazarusr@georgetown.edu
Counsel for Respondents Riverkeeper, Inc., et al.

MAUREEN E. MAHONEY
Counsel of Record
PHILIP J. PERRY
J. SCOTT BALLENGER
CASSANDRA S. BERNSTEIN
DREW C. ENSIGN
LATHAM & WATKINS LLP
555 11TH STREET, NW
SUITE 1000
WASHINGTON, DC 20004
(202) 637-2200
maureen.mahoney@lw.com
Counsel for Petitioners PSEG Fossil LLC and PSEG Nuclear LLC

Additional Counsel Listed on Inside Cover

PETITIONS FOR CERTIORARI FILED NOVEMBER 2, 2007
CERTIORARI GRANTED APRIL 14, 2008

GREGORY G. GARRE
ACTING SOLICITOR GENERAL
Counsel of Record
RONALD J. TENPAS
DAVID S. GUALTIERI
CYNTHIA J. MORRIS
JESSICA O'DONNELL
DEPARTMENT OF JUSTICE
WASHINGTON, DC 20530
(202) 51402217
SupremeCtBriefs@USDOJ.gov
Counsel for Federal Respondents

PATRICK C. LYNCH
ATTORNEY GENERAL OF RHODE ISLAND
TRICIA O'HARE JEDELE
SPECIAL ASSISTANT ATTORNEY GENERAL
Counsel of Record
150 SOUTH MAIN STREET
PROVIDENCE, RI 02903
(401) 274-4400, EXT. 2400
tjedele@riag.ri.gov
Counsel for State Respondents

ELISE E. ZOLI
Counsel of Record
KEVIN P. MARTIN
ROBERT H. FITZGERALD
ALADDINE D. JOROFF
KEVIN P. PECHULIS
GOODWIN PROCTER LLP
53 STATE STREET
BOSTON, MA 02109
(617) 570-1000
EZoli@goodwinprocter.com
Counsel for Petitioner Entergy Corp.

KRISTY A. N. BULLEIT
Counsel of Record
HUNTON & WILLIAMS LLP
1900 K STREET, NW
WASHINGTON, DC 20006
(202) 955-1547
kbulleit@hunton.com
Counsel for Petitioner Utility Water Act Group

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United States Court of Appeals for the Second Circuit, Relevant Docket Entries, Case Nos. 04-6692-ag, 04-6693-ag CON, 04-6694-ag CON, 04-9965-ag CON, 04-6696-ag CON, 04-6697-ag CON, 04-6698-ag CON, 04-6699-ag CON JA-1

41 Fed. Reg. 17,387 (Apr. 26, 1976) (preamble) JA-38

In re Brunswick Steam Electric Plant, EPA GCO 41 (June 1, 1976) JA-50

In re Public Service Co. of New Hampshire, et al. (Seabrook Station, Units 1 and 2) National Pollutant Discharge Elimination System Permit, Case No. 76-7, 1 E.A.D. 332, 1977 WL 22370 (EAB June 10, 1977) JA-63

Science Applications International Corp., *Preliminary Regulatory Development Section 316(b) of the Clean Water Act; Background Paper Number 1: Legislative, Regulatory, and Legal History of Section 316(b) and Information on Federal and State Implementation of Cooling Water Intake Structure Technology Requirements* (Apr. 4, 1994) (excerpts) JA-116

EPA, *Economic and Engineering Analyses of the Proposed §316(b) New Facility Rule*, Chapter 11: CWIS Impacts and Potential Benefits, Table 11-1 (Aug. 2000) JA-165

Comments of the New Jersey Department of Environmental Protection regarding Proposed Rule on Cooling Water Intake Structures (New Facilities) (Nov. 9, 2000).... JA-168

David K. Gordon & Reed W. Super, Riverkeeper, et al., Subject Matter Code 10.11 (Comment ID 316bNFR.206.014), *Request for Comment: Dry Cooling–Proposed Option* (Jan. 2, 2002)..... JA-189

E-mail between Chief of the Permits Section, Surface Water Quality Division, Michigan Department of Environmental Quality and EPA regarding 316(b) Burden (Jan. 24, 2002) JA-209

Comment Letter of Frank Ackerman, Global Development and Environment Institute regarding Proposed Rule, RIN 2040-AD62, Clean Water Act of §316(b) – National Pollutant Discharge Elimination System – Proposed Regulations for Cooling Water Intake Structures at Phase II Existing Facilities, EPA 1CR no. 2060.01 (Aug. 1, 2002) JA-211

Comments of California State Water Resources Control Board regarding National Pollutant Discharge Elimination System Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Proposed Rule) (Aug. 5, 2002) JA-245

Comments of Atlantic States Marine Fisheries Commission on Cooling Water Intake Structure (Existing Facilities: Phase II) (Aug. 7, 2002) JA-256

Comments of Florida Department of Industrial Wastewater on National Pollutant Discharge Elimination System–Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Aug. 7, 2002) JA-260

Comments of New York State Department of Environmental Conservation Office of Natural Resources Regarding the NPDES Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Aug. 7, 2002) JA-264

Comment Letter of Frank Ackerman and Rachel Massey, Global Development and Environment Institute, regarding Notice of Data Availability, EPA 40 CFR Part 125, Clean Water Act §316(b) – National Pollutant Discharge Elimination System – Proposed Regulations for Cooling Water Intake Structures at Phase II Existing Facilities; Notice of Data Availability, March 19, 2003 (June 2, 2003) JA-277

Paul E. Reynolds, Hoosier Energy Rural Elect. Co-op, Subject Matter Code 10.07.02 (Comment ID 316bEFR.006.003), *RFC: Appropriateness of "significantly greater"* (Mar. 29, 2004) JA-308

Carl Michael Smith, Department of Energy, Subject Matter Code 17.03.02 (Comment ID 316bEFR.010.027), *RFC: EPA rationale to not require closed-cycle* (Mar. 29, 2004) JA-311

Carl Michael Smith, Department of Energy, Subject Matter Code 9.0 (Comment ID 316bEFR.010.057), *Costs* (Mar. 29, 2004) JA-314

Carl Michael Smith, Department of Energy, Subject Matter Code 9.0 (Comment ID 316bEFR.010.101), *Costs* (Working Draft – May 23, 2002) (Mar. 29, 2004) JA-318

Christine Martin, Pennsylvania Department of Environmental Protection, Subject Matter Code 18.01 (Comment ID 316bEFR.011.004), *RFC: Definition of "adverse environmental impact"* (Mar. 29, 2004) JA-340

Elise N. Zoli, Goodwin Procter Counselors at Law obo Entergy Corporation, Subject Matter Code 9.0 (Comment ID 316bEFR.029.032), *Costs* (Mar. 29, 2004) JA-343

Maureen F. Vaskis & Mark F. Strickland, PSEG Services Corp., Office of Environmental Counsel, Subject Matter Code 9.04 (Comment ID 316bEFR.075.057), *Cooling system costs (e.g., dry, wet, recirculating)* (Mar. 29, 2004) JA-345

Doug Dixon & Kent Zammit, EPRI, Subject Matter Code 21.04 (Comment ID 316bEFR.306.116), *Determination of Compliance* (Mar. 29, 2004) JA-352

Basil G. Constantelos, Midwest Generation EME, LLC, Subject Matter Code 6.03 (Comment ID 316bEFR.317.013), *Impacts of CWIS on impaired waterbodies* (Mar. 29, 2004) JA-354

ITEMS PREVIOUSLY REPRODUCED

In accordance with Supreme Court Rule 26.1, the following items have been omitted in printing this joint appendix because they appear on the following pages of the appendix to the Petition for a Writ of Certiorari filed by Entergy Corp. Case No. 07-588) on November 2, 2007:

Opinion of the United States Court of Appeals for the Second Circuit, *Riverkeeper, Inc. v. U.S. EPA*, No. 04-6692-ag(L) and consolidated cases (2d Cir. Jan. 25, 2007) 1a

National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576 (July 9, 2004) 122a

RELEVANT DOCKET ENTRIES

United States Court of Appeals for the Second Circuit

Lead Docket No : 04-6692 –ag, *consolidated with* Nos. 04-6693-ag CON, 04-6694-ag CON, 04-6695-ag CON, 04-6696-ag CON, 04-6697-ag CON, 04-6698-ag CON, 04-6699-ag CON

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Surfrider Foundation, filed. [Entry date Jan 20 2005] [SM]
12/28/04	Copy of EPA decision and order, dated 7/9/04, filed. [Entry date Jan 21 2005] [SM]
12/28/04	Papers from the Ninth Circuit Court Appeals, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the Court of Appeals for the Ninth Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
1/21/05	Served copy of petition under cover letter on respondent. [Entry date Jan 21 2005] [SM]
2/8/05	PETITIONER State of Rhode Island, Form C/A filed, with proof of service. [Entry date Feb 14 2005] [SM]

2/8/05	Non-Binding Statement of Issues, received. [Entry date Feb 14 2005] [SM]
2/14/05	Scheduling order #1 filed. Record or certified list due 7/18/2005. [Entry date Feb 14 2005] [SM]
	* * *
2/16/05	Order vacating scheduling order # 1, filed. [Entry date Feb 16 2005] [SM]
	* * *
2/24/05	Letter, dated 2/23/05 received from Elise N. Zoli informing the Court that [she] is the lead attorney for Entergy Corporation and for all documentation to be sent to the attention of Elise Zoli. [Entry date Feb 28 2005] [SM]
3/1/05	PETITIONER Surfrider Foundation, Form C/A received, with proof of service. [Entry date Mar 2 2005] [SM]
3/1/05	Notice of appeal acknowledgment letter from Reed Super received. [Entry date Mar 2 2005] [SM]
4/1/05	Scheduling order #1 filed. Record or certified list due 5/6/2005. Petitioners brief due 5/13/2005 (10 Copies). Respondents brief due 6/13/2005 (10 Copies). Ready week 7/25/2005. A pre-argument conference is scheduled for Friday, 4/22/05 at 3:00 p.m. (LJG - Staff Counsel). [Entry date Apr 4 2005] [SM]

4/1/05	Pre-Argument Notice and Order from Lisa Greenberg, Filed. Scheduled For: Friday, 4/22/05 at 3:00 p.m. [Entry date Apr 4 2005] [SM]
4/4/05	Petitioner Riverkeeper, Inc. motion to modify briefing schedule, procedure and word limit filed with proof of service. [Entry date Apr 5 2005] [SM]
4/25/05	Record on appeal index in lieu of record filed. [Entry date May 11 2005] [SM]
5/12/05	Scheduling order #2 filed. Petitioners brief service date 6/16/05, filing date 6/17/2005. Intervenor and Amicus Briefs in support of Petitioners service date 7/7/05, filing dated 7/8/05. Respondent EPA's Consolidated Brief service date 10/21/05, filing dated 10/24/05. Petitioner's Supplemental Briefs or Intervenor briefs and Amicus Briefs in support of EPA (if any) service date 11/21/05, filing date 11/22/05. Petitioner's reply brief service date 12/19/05, filing date 12/20/05. Deferred Appendix service date 1/20/06, filing dated 1/23/06. Final Briefs service date 2/22/05, filing dated 2/23/05. [Entry date May 12 2005] [SM]
	* * *
5/12/05	Order FILED GRANTING motion to establish briefing schedule and to set procedures for briefing by Petitioner Riverkeeper, Inc., endorsed on motion dated 6/16/2005. (For the Court: AMH,

Motions Staff Attorney) (Before: PWH, C.J.) [Entry date Jun 28 2005] [MA]

6/16/05 Petitioner State of Rhode Island, Petitioner State of Connecticut, Petitioner State of Delaware, et al motion for extension of briefing schedule filed with proof of service. [Entry date Jun 23 2005] [MA]

7/6/05 Scheduling order #3 filed. Ready week 4/24/2006. Petitioners` Opening Briefs due 7/6/2005. Deferred joint appendix due 2/24/2006. Final Briefs filed by 3/28/2006. (See motion order filed this date, granting motion for extension of time, in order to see all the brief due dates.) [Entry date Jul 6 2005] [MA]

7/6/05 PETITIONERS' reply brief due January 24, 2006. [Entry date Jul 6 2005] [MA]

7/6/05 Intervenor and Amicus Briefs in support of Petitioner filed by 7/27/05. [Entry date Jul 6 2005] [MA]

7/6/05 Intervenor and Amicus Briefs in support of EPA filed by, December 13, 2005. [Entry date Jul 6 2005] [MA]

* * *

7/6/05 Order FILED GRANTING motion for extended time by Petitioner State of Rhode Island, Petitioner State of Connecticut, Petitioner State of Delaware, Petitioner State of New

Jersey, Petitioner State of New York, endorsed on motion dated 6/16/2005. "IT IS HEREBY ORDERED that the motion to extend time to file brief (on consent) is GRANTED. The new scheduling order is as follows: Petitioners` Opening Briefs filed by, July 6, 2005. Intervenor and Amicus Briefs in Support of Petitioner filed by, July 27, 2005. Respondent EPA`s consolidated Brief filed by, November 10, 2005. Petitioner`s Supplemental Briefs filed by, December 13, 2005. Intervenor and Amicus Briefs in support of EPA filed by, December 13, 2005. Petitioner`s Reply Briefs filed by, January 24, 2006. Deferred Appendix filed by, February 24, 2006. Final Briefs filed by, March 28, 2006. Appeal to be heard as early as the week of April 24, 2006." (For the Court: AMH, Motions Staff Attorney) (Before: PWH, C.J.) [Entry date Jul 6 2005] [MA]

* * *

7/26/05 Clean Air Task Force brief received. [Entry date Sep 6 2005] [EJ]

7/26/05 MOVANT Clean Air Task Force, motion to file as amicus, received. Problem – no T-1080. [Entry date Sep 6 2005] [EJ]

7/27/05 Movant OMB Watch motion to file brief as amicus curiae, filed with proof of service. [Entry date Aug 11 2005] [DP]

* * *

8/17/05 Order FILED REFERRING motion to file brief as amicus curiae by Movant OMB Watch to the Panel hearing the appeal. (TWY) [Entry date Aug 17 2005] [DP]

* * *

9/9/05 Movant Healthlink, Movant Kentucky Resources Council, et al motion to file brief as amicus curiae, filed with proof of service. [Entry date Oct 13 2005] [DP]

* * *

10/18/05 Order FILED REFERRING motion file brief as amicus curiae to the merits panel by Movant Clean Air Task Force, Movant Healthlink, Movant Kentucky Resources Council, Movant New England Clean Water Action, Movant Ohio Evironmental Council, Movant Ohio Valley Environmental Council. (AH) [Entry date Oct 18 2005] [DP]

* * *

11/14/05 Declaration of Jessica O'Donnell in support of the motion for leave to file corrected certified index to the administrative record, filed with proof of service. [Entry date Dec 8 2005] [DP]

11/14/05 Declaration of Jessica O'Donnell in support of the motion to strike portions of briefs that rely upon material outside of the administrative record, filed with

proof of service. [Entry date Dec 8 2005] [DP]

11/14/05 Respondent United States Environmental Protection Agency motion for leave to correct administrative record index, filed with proof of service. [Entry date Dec 7 2005] [DP]

11/14/05 Respondent United States Environmental Protection Agency motion to strike portions of briefs that rely upon material outside of the administrative record, filed with proof of service. [Entry date Dec 8 2005] [DP]

* * *

12/13/05 AMICUS CURIAE Texas Commission on Environmental Quality, brief filed with proof of service. [Entry date Dec 14 2005] [DP]

* * *

12/13/05 AMICUS CURIAE State of Alabama, State of Indiana, State of Kentucky, State of Nebraska, ET AL, brief filed with proof of service. [Entry date Dec 14 2005] [DP]

* * *

12/13/05 Movant American Petroleum Institute motion for leave to file a brief amicus curiae, filed with proof of service. [Entry date Dec 14 2005] [DP]

* * *

12/14/05 Petitioner PSEG Fossil LLC, Petitioner PSEG Nuclear LLC motion to supplement the Appellate record on appeal, filed with proof of service. [Entry date Dec 15 2005] [DP]

12/14/05 Order FILED GRANTING motion for an extension of time by Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation. (AH) Response to be filed by December 20, 2005; EPA's reply by January 23, 2006. [Entry date Dec 14 2005] [DP]

12/14/05 Order FILED REFERRING motion to strike portions of briefs that rely upon material outside of the administrative record to the merits panel by Respondent Michael Leavitt, Respondent United States Environmental Protection Agency.(AH) [Entry date Dec 14 2005] [DP]

* * *

12/16/05 Order FILED REFERRING motion to supplement the appellate record on appeal to the merits panel, by Petitioner PSEG Fossil LLC, Petitioner PSEG Nuclear LLC. (AH) [Entry date Dec 16 2005] [DP]

12/20/05 Petitioner, Entergy Corporation's Memorandum in opposition to EPA's motion to strike portions of the briefs that rely upon material outside of the

administrative record, filed with proof of service. [Entry date Dec 27 2005] [DP]

* * *

12/21/05 State Petitioners' brief in support of the motion to supplement the administrative record and for judicial notice, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 State Petitioners' brief in opposition to EPA's motion to strike portions of State Petitioners' briefs, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 State Petitioners' brief in opposition to EPA's motion for leave to file corrected certified index of administrative record, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 Environmental Petitioners' opposition to EPA's motion for leave to file corrected index to the record, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 Environmental Petitioners' opposition to EPA's motion to strike portions of briefs that rely on material outside of the administrative record, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 Declaration of Reed W. Super in support of the motion to supplement the record an/or for judicial notice. [Entry date Dec 27 2005] [DP]

12/21/05 Environmental Petitioners motion to supplement record and/or for judicial notice, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/21/05 Petitioner State of Connecticut, Petitioner State of Delaware, Petitioner State of New Jersey, et al motion to supplement appellate record and for Judicial Notice, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/22/05 Petitioners, Utility Water Act Group, Appalahian Power Company and Illinois Energy Association opposing in part to EPA's motion to strike portions of briefs, filed with proof of service. [Entry date Dec 27 2005] [DP]

12/27/05 EPA's opposition to motion of Petitioner's PSEG FOSSIL LLC and PSEG NUCLEAR LLC to supplement the appellate record or, in the alternative, for judicial notice, filed with proof of service. [Entry date Dec 28 2005] [DP]

* * *

12/28/05 RESPONDENT United States Environmental Protection Agency, Michael Leavitt, AMENDED certified list of items comprising the record on appeal filed. [Entry date Dec 29 2005] [DP]

12/28/05 Order FILED GRANTING motion for leave to file corrected administrative

record index by Respondent United States Environmental Protection Agency. Before Hon. PWH, C.J., endorsed by AH, Motions Staff Attorney, dated 12/28/05. [Entry date Dec 28 2005] [DP]

* * *

12/30/05 IT IS HEREBY ORDERED that this motion, and any future motions to supplement the record and/or for judicial notice, absent extraordinary circumstances, are referred to the panel that will decide the appeal. Before: Hon. Peter W. Hall, C.J., endorsed by TWY, Motions Staff Attorney, dated 12/30/05. [Entry date Dec 30 2005] [DP]

* * *

1/20/06 IT IS HEREBY ORDERED that the motion for an extension of time is GRANTED to the following extent: The petitioner`s reply brief shall be filed on or before February 24,2006; deferred joint appendix due 3/24/2006, briefs in final form shall be filed before April 18, 2006, extended ready week is 5/22/2006. (AH) [Entry date Jan 20 2006] [DP]

1/23/06 Declaration of Jessica O'Donnell in support of the motion for leave to file combined reply brief and opposition to cross-motions, filed with proof of service. [Entry date Jan 25 2006] [DP]

1/23/06 Respondent Michael Leavitt, Respondent United States Environmental Protection Agency motion for leave to file combined reply brief and opposition to cross-motions, filed with proof of service. [Entry date Jan 25 2006] [DP]

1/27/06 Reply of Petitioners PSEG FOSSIL LLC and PSEG NUCLEAR LLC to EPA's Opposition to motion to supplement the appellate record or, in the alternative, for judicial notice, filed with proof of service. [Entry date Jan 30 2006] [DP]

* * *

1/30/06 RESPONDENT United States Environmental Protection Agency, Michael Leavitt, brief in support of their motion to strike (filed 11/14/05) and in opposition to cross-motions to supplement the record (filed on 12/21/05), FILED. [Entry date Feb 9 2006] [DP]

1/30/06 Order FILED GRANTING motion for leave to file combined reply brief and opposition to cross-motions by Respondent United States Environmental Protection Agency, Respondent Michael Leavitt. (AH) [Entry date Jan 30 2006] [DP]

1/30/06 EPA's opposition to Petitioners' cross-motions to supplement the record on appeal, filed with proof of service. [Entry date Jan 30 2006] [DP]

1/30/06 Combined Reply in support of EPA's motion to strike portions of briefs that rely upon material outside of the Administrative record, strike document filed with proof of service. [Entry date Jan 30 2006] [DP]

2/6/06 Reply of Environmental Petitioners to EPA's opposition to motion to supplement the record and/or for judicial notice, filed with proof of service. [Entry date Feb 9 2006] [DP]

* * *

3/3/06 PETITIONER Entergy Corporation, reply brief filed with proof of service. [Entry date Mar 7 2006] [DP]

* * *

3/6/06 It is hereby Ordered that the motion for an extension of time by Petitioner Surfrider Foundation, Petitioner Riverkeeper, Inc., is GRANTED to an including March 3, 2006. (AH) Extended Ready week is 5/22/2006. [Entry date Mar 6 2006] [DP]

* * *

3/28/06 Joint appendix received. PETITIONER Riverkeeper, Inc., Surfrider Foundation (Vol 7) [Entry date Mar 29 2006] [DP]

3/28/06 Petitioner PETITIONER Riverkeeper, Inc., Surfrider Foundation, special

appendix received. (vol 2) [Entry date Mar 29 2006] [DP]

3/28/06 PETITIONER Riverkeeper, Inc., Surfrider Foundation, supplemental joint appendix received. (vol 2) [Entry date Mar 29 2006] [DP]

3/28/06 PETITIONER Riverkeeper, Inc., Surfrider Foundation, joint appendix filed w/pfs. (vol 7) [Entry date Mar 29 2006] [DP]

3/28/06 Petitioner PETITIONER Riverkeeper, Inc., Surfrider Foundation, special appendix filed (w/pfs) (vol 2) [Entry date Mar 29 2006] [DP]

4/6/06 Stipulation to amend caption RECEIVED. [Entry date Apr 6 2006] [DP]

4/11/06 Set for argument on 6/8/06. [Entry date Apr 11 2006] [AV]

* * *

4/19/06 Environmental Petitioners 28(J) letter FILED. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER State of Connecticut, State of Delaware, State of New Jersey, State of New York, ET AL, brief in final form with proof of service filed. Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Appalachian Power Company, Illinois Energy Association,

brief in final form with proof of service filed. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER PSEG Fossil LLC, PSEG Nuclear LLC, brief in final form with proof of service filed. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Entergy Corporation, brief in final form with proof of service filed. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Riverkeeper, Inc., Surfrider Foundation, brief in final form with proof of service filed. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER PSEG Fossil LLC, PSEG Nuclear LLC, supplemental brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Entergy Corporation, supplemental brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Appalachian Power Company, Illinois Energy Association, supplemental brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER State of Connecticut, State of Delaware, State of New Jersey, State of New York, ET AL, supplemental brief (FF) filed with proof

of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Riverkeeper, Inc., Surfrider Foundation, supplemental brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 Notice of Errata regarding the Final Brief for Respondents received. [Entry date Apr 19 2006] [DP]

4/19/06 RESPONDENT United States Environmental Protection Agency, Michael Leavitt, brief in final form with proof of service filed. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Riverkeeper, Inc., Surfrider Foundation, reply brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Appalachian Power Company, reply brief (FF) filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER State of Connecticut, State of Delaware, State of New Jersey, State of New York, ET AL, reply brief filed (FF) with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER PSEG Fossil LLC, PSEG Nuclear LLC, reply brief filed with proof

of service. [Entry date Apr 19 2006] [DP]

4/19/06 PETITIONER Entergy Corporation, reply brief filed with proof of service. [Entry date Apr 19 2006] [DP]

4/19/06 Letter received from PSEG FOSSIL LLC and PSEG nuclear LLC regarding non-substantive changes to citation designations in their final brief, dated 4/17/06. [Entry date Apr 19 2006] [DP]

4/19/06 State of Illinois brief in support of Environmental and State Petitioners, filed with proof of service. [Entry date Apr 26 2006] [DP]

5/1/06 Letter received from Environmental Petitioners requesting a 10-minute expansion of the time allotted for oral argument, dated 4/27/06. [Entry date May 1 2006] [DP]

* * *

5/3/06 Letter received from James Christman in response of Industry Petitioners Utility Water Act Group, Appalachian Power Company, and Illinois Energy Association, Entergy Corp., PSEG Fossil LLC and PSEG Nuclear LLC to the request for additional time for oral argument from Riverkeeper, Inc, dated 5/2/06. [Entry date May 3 2006] [DP]

5/4/06 ENVIRONMENTAL PETITIONERS, 28(J) letter FILED, dated 5/3/06. [Entry date May 5 2006] [DP]

5/5/06 Letter received from State Petitioners requesting that the Court grant State Petitioners a proportionally equal share of time for oral argument, dated 5/3/06. [Entry date May 8 2006] [DP]

5/5/06 Letter received from Respondent, stating that EPA does not take any position as to whether the Court should grant any pending requests for additional oral argument time. If the Court were to deny all of the Petitioner's requests, EPA asks the Court to expand EPA's time for oral argument so the EPA's time is equal to the Petitioner's total time under the current allotment. On the other hand, if the Court grants Petitioner's requests for more oral argument time, EPA asks the Court to give EPA the same total of minutes for argument as the expanded total number of minutes granted to Petitioners. Letter dated 5/4/06. [Entry date May 11 2006] [DP]

* * *

5/11/06 Non-dispositive stipulation to amend caption, FILED. [Entry date May 11 2006] [AV]

5/11/06 The CAPTION PAGE for this appeal has been AMENDED as per stipulation

dated 5/11/06. [Entry date May 11 2006] [DP]

5/23/06 Order filed stating: "The panel will reserve decision on all motions to strike portions of the record or briefs, or to supplement the record, until such time as we issue our decision on the merits of the case. FOR THE COURT: Roseann B. MacKechnie, Clerk of Court." [Entry date May 23 2006] [PC]

* * *

6/1/06 Letter received from Karl Lytz and Kristy Bulleit, attorneys for Utility Water Act Group, Appalachian Power Company, Illiniois Energy Association, PSEG Fossil LLC and PSEG Nuclear LLC request that they each be allowed to reserve eight minutes of argument time, dated 5/31/06. [Entry date Jun 2 2006] [DP]

6/5/06 Notice to counsel regarding letter dated May 31, 2006 by Kristy A.N. Bulleit, counself for UWAG, requesting that each party be allowed to reserve eight minutes of argument time, has been DENIED. [Entry date Jun 5 2006] [AG]

* * *

6/8/06 Case heard before: STRAUB, SOTOMAYOR, HALL, CJJ. [Entry date Jun 8 2006] [SC]

* * *

6/23/06	PETITIONER Entergy Corporation, 28(J) letter FILED. [Entry date Jun 26 2006] [DP]
6/26/06	ENVIRONMENTAL PETITIONERS, 28(J) letter FILED. [Entry date Jun 27 2006] [DP]
6/26/06	RESPONDENT United States Environmental Protection Agency, Michael Leavitt, post argument letter brief filed, dated 6/23/06. [Entry date Jun 27 2006] [DP]
	* * *
8/1/06	Letter received from Petitioner, State of Rhode Island, dated 7/31/06. [Entry date Aug 2 2006] [DP]
8/14/06	Letter received from Cynthia Morris, Counsel for EPA, requesting for the Court to disregard the States` letter in its entirety, dated 8/11/06. [Entry date Aug 14 2006] [DP]
8/14/06	Letter received from James Christman, counsel for UWAG, Appalachian Power Company, and Illinois Energy Association, requesting that the Court disregard the States' letter, dated 8/11/06. [Entry date Aug 14 2006] [DP]
1/25/07	Notice to counsel in re: Opinion filed on 01/25/2007. [Entry date Jan 25 2007] [YS]

1/25/07	Judgment filed. [Entry date Jan 31 2007] [YS]
1/25/07	Petitions are GRANTED in part and DENIED in part and DISMISSED as to one aspect of the petitions for lack of jurisdiction because their is no final agency action to review, by published signed opinion filed. (SS) [Entry date Jul 25 2007] [LY]
2/5/07	Letter received from Reed Super, Counsel for Environmental Petitioners advising the court of the typographical errors in the decision issued on 01/25/2007. [Entry date Feb 6 2007] [YS]

* * *

2/14/07	Errata sheet re: Page 2195 Line 2, 4, Page 8215 First full paragraph line 3, Page 8224 first full paragraph, line 1, Page 8249 first paragraph, line 16, filed. [Entry date Feb 14 2007] [YS]
2/14/07	Notice to counsel in re: Errata sheet filed. [Entry date Feb 14 2007] [YS]
2/28/07	Respondent Michael Leavitt, Respondent United States Environmental Protection Agency motion extended time to file Petition for Rehearing/ Rehearing En Banc, filed with proof of service. [Entry date Mar 5 2007] [YS]

3/9/07 Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation motion for briefing schedule for attorney's fee Application filed with proof of service. [Entry date Mar 9 2007] [MR]

* * *

3/13/07 Order FILED GRANTING motion extended time by Respondent Michael Leavitt, Respondent United States Environmental Protection Agency, to file petition for rehearing/rehearing en banc to 04/26/2007, endorsed on motion dated 3/9/2007. (Before Hon. CJS., SS., PWH., C.J. by AH) [Entry date Mar 13 2007] [YS]

3/14/07 Order FILED GRANTING motion file brief as amicus curiae by Movant OMB Watch, in light of Opinion filed. [Entry date Mar 14 2007] [YS]

3/14/07 Order FILED GRANTING motion file brief as amicus curiae by Movant Healthlink, Movant Clean Air Task Force, Movant Kentucky Resources Council, Movant New England Clean Water Action, Movant Ohio Environmental Council, Movant Ohio Valley Environmental Council, in light of opinion filed. [Entry date Mar 14 2007] [YS]

3/14/07 Order FILED GRANTING motion file brief as amicus curiae by Movant American Petroleum Institute, in light of

opinion filed. [Entry date Mar 14 2007] YS]

3/15/07 Order FILED DENYING motion strike document by Respondent Michael Leavitt, Respondent United States Environmental Protection Agency, as Moot in light of Opinion filed. [Entry date Mar 15 2007] [YS]

3/15/07 Order FILED DENYING motion supplement record on appeal by Petitioner PSEG Fossil LLC, Petitioner PSEG Nuclear LLCM, as MOOT in light of Opinion filed. [Entry date Mar 15 2007] [YS]

3/15/07 Order FILED DENYING motion supplement record on appeal by Petitioner American Littoral Society, as MOOT in light of Opinion filed. [Entry date Mar 15 2007] [YS]

3/15/07 Order FILED DENYING motion supplement record on appeal by Petitioner State of New Jersey, Petitioner State of New York, Petitioner State of Connecticut, Petitioner American Littoral Society, Petitioner State of Rhode Island, Petitioner State of Delaware, Petitioner Commonwealth of Massachusetts, as MOOT in light of Opinion filed. [Entry date Mar 15 2007] [YS]

* * *

3/19/07 Order FILED GRANTING motion to set briefing schedule for attorney`s fees by Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation. Schedule requested will be set after rehearing deadlines have expired, endorsed on motion dated 3/9/2007. (Before Hon. CJS., SS., PWH., C.J. by AH) [Entry date Mar 19 2007] [YS]

4/17/07 Petitioner Appalachian Power Company for extension of time until May 14, 2007, to file Petition for Rehearing and Rehearing En Banc, filed with proof of service. [Entry date Apr 17 2007] [YS]

4/20/07 Notice from Supreme Court granting FILERS extension of time in which to file a writ of certiorari received to and including 05/25/2007. [Entry date Apr 20 2007] [YS]

* * *

4/24/07 Order FILED GRANTING motion extended time by Petitioner Appalachian Power Company, endorsed on motion dated 4/17/2007. Extended Petition for rehearing is 5/14/2007. (Before Hon. CJS., SS., PWH., C.J. by AH) [Entry date Apr 24 2007] [YS]

5/14/07 Petitioner, Utility Water Act Group, PSEG Fossil LLC, Petitioner PSEG Nuclear LLC motion Petition for rehearing and petition for rehearing en

banc filed with proof of service. [Entry date May 15 2007] [YS]

5/14/07 Petitioner Entergy Corporation Petition for rehearing and petition for rehearing en banc filed with proof of service. [Entry date May 15 2007] [YS]

* * *

7/5/07 Order FILED DENYING Petition for rehearing Docket as of June 02, 2008 11:08 am and petition for rehearing en banc by Petitioner PSEG Fossil LLC, Petitioner PSEG Nuclear LLC. [Entry date Jul 5 2007] [YS]

7/5/07 Order FILED DENYING Petition for rehearing and petition for rehearing en banc by Petitioner Entergy Corporation. [Entry date Jul 5 2007] [YS]

7/17/07 Judgment MANDATE ISSUED. CLOSED [Entry date Jul 17 2007] [YS]

7/24/07 Letter sent to district court recalling mandate. [Entry date Jul 24 2007] [YS]

* * *

7/24/07 Order filed stating: Petitioner's motion for attorneys' fees shall be filed on or before January 5, 2008; the respondent shall file its opposition on or before February 5, 2008; petitioner's reply papers shall be filed on or before February 26, 2008. (By AH) [Entry date Jul 24 2007] [YS]

* * *

9/27/07	Notice from Supreme Court granting extension of time in which to file a writ of certiorari received to and including November 2, 2007. [Entry date Sep 28 2007] [YS]

* * *

11/8/07	Notice of filing petition for Utility Water Act Group dated 11/02/2007 filed. Supreme Court #: 07-597. [Entry date Nov 9 2007] [YS]
11/9/07	Notice of filing petition for PETITIONER PSEG Fossil LLC, PSEG Nuclear LLC, dated 11/02/2007 filed. Supreme Court #: 07-589. [Entry date Nov 9 2007] [YS]
11/9/07	Notice of filing petition for PETITIONER Entergy Corporation, dated 11/02/2007 filed. Supreme Court #: 07-588. [Entry date Nov 13 2007] [YS]
11/15/07	Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation motion for extension of time to file attorneys' fees with 30 days for response and 21 days for reply and continuing to defer issuance of mandate until fee application is resolved, filed with proof of service. [Entry date Nov 16 2007] [YS]
11/27/07	Notice to counsel regarding Court's Order dated 11/27/07 granting the Petitioner's motion for an extension of

time to file motion for Attorney's fees and to defer the issuance of the mandate until dee application is resolved. [Entry date Nov 27 2007] [JR]

11/27/07 Order FILED GRANTING motion an extension of time to file motion for Attorney`s fees & to defer issuance of mandate by Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation, endorsed on motion dated 11/15/2007. IT IS HEREBY ORDERED that Petitioner`s motion for extension of time to file motion for Attorney`s fees and to defer issuance of mandate until fee application is resolved is GRANTED. Before: CJS SS & PWH, CJJ. (JP) [Entry date Nov 27 2007] [JR]

* * *

4/17/08 Letter dated 04/17/2008 from the Supreme Court advising of order GRANTING petition for writ of certiorari by PETITIONERS, filed. (Supreme Court # 07-597) [Entry date Apr 18 2008] [YS]

4/17/08 Writ of Certiorari GRANTED. [Entry date Apr 18 2008] [YS]

4/18/08 Reinstatement filed in light of Supreme Court Letter received Granting Writ of Cert, FILED. Reinstatement Code: M. [Entry date Apr 18 2008] [YS]

5/14/08 Petitioner Riverkeeper, Inc., Petitioner Surfrider Foundation motion for 1. new briefing schedule for motion for award of attorneys' fees and costs pursuant to Clean Water Act Sec 509(b)(3) and 2. hold of mandate until fee application is resolved. Fee motion would be due 120 days after Supreme Court decision in this case with 30 days for opposition and 21 days for reply, filed with proof of service. [Entry date May 15 2008] [YS]

* * *

5/27/08 IT IS HEREBY ORDERED that Petitioner's motion for extension of time and for an award of attorneys` fees/costs until 120 days after the Supreme Court issues its decision: and to defer issuance of mandate until fee application is resolved is GRANTED. (Before Hon. CJS., SS., PWH., CJJ., by JP) [Entry date May 27 2008] [YS]

* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6693-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Commonweaith of Massachusetts, State of Connecticut, State of Delaware, State of New Jersey, ET AL, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from the First Circuit Court of Appeals, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the Court of Appeals for the First Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
	* * *
2/4/05	Notice of appeal acknowledgment letter from FILERS State of Delaware received. [Entry date Feb 9 2005] [SM]
2/8/05	Notice of appeal acknowledgment letter from FILERS State of Rhode Island received. [Entry date Feb 14 2005] [SM]
2/8/05	Notice of appeal acknowledgment letter from FILERS Commonwealth of

	Massachusetts received. [Entry date Feb 14 2005] [SM]
2/8/05	Notice of appeal acknowledgment letter from FILERS The State of Connecticut received. [Entry date Feb 14 2005] [SM]
2/8/05	Notice of appeal acknowledgment letter from FILERS The State of New Jersey received. [Entry date Feb 14 2005] [SM]

* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6694-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Appalachian Power Company, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from United States Court of Appeals for the Fourth Circuit, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the United States Court of Appeals for the Fourth Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
	* * *
2/18/05	Notice of appeal acknowledgment letter from James N. Christman, attorney for Appalachian Power Company FILERS received. [Entry date Feb 22 2005] [SM]
2/18/05	PETITIONER Appalachian Power Company, Form C/A filed, with proof of service. [Entry date Feb 22 2005] [SM]
	* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6695-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Utility Water Act Group, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from the United States Court of Appeals for the Second Circuit, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the Court of Appeals for the Second Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
	* * *
2/14/05	Notice to counsel re: Amended Caption and docket sheet. [Entry date Feb 14 2005] [SM]
3/8/05	Notice of appeal acknowledgment letter from Kristy A.N. Bulleit received. [Entry date Mar 10 2005] [SM]
3/8/05	PETITIONER Utility Water Act Group, Form C/A received, with proof of service. [Entry date Mar 10 2005] [SM]

3/8/05	Letter, dated 3/4/05 received from Kristy A.N. Bulleit stating the enclosure of the Acknowledgement letter and Form C-A. [Entry date Mar 10 2005] [SM]

* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6696-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER PSEG Fossil LLC, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from The United States Court of Appeals for the District of Columbia Circuit, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the United States Court of Appeals for the District of Columbia Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
	* * *
2/16/05	Notice of appeal acknowledgment letter from PSEG Fossil LLC and PSEG Nuclear LLC FILERS received. [Entry date Feb 22 2005] [SM]
2/16/05	PETITIONER PSEG Fossil LLC, PSEG Nuclear LLC, Form C/A filed, with proof of service. [Entry date Feb 22 2005] [SM]
	* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6697-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Entergy Corporation, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from the United States Court of Appeals for the Fifth Circuit, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the United States Court of Appeals for the Fifth Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
	* * *
2/15/05	Notice of appeal acknowledgment letter from Entergy Corperation FILERS received. [Entry date Feb 22 2005] [SM]
2/15/05	PETITIONER Entergy Corporation, Form C/A filed, with proof of service. [Entry date Feb 22 2005] [SM]
	* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6698-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Illinois Energy Association, filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from the United States Court of Appeals for the Seventh Circuit PETITIONER, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the United States Court of Appeals for the Seventh Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
2/18/05	Notice of appeal acknowledgment letter from James N. Christman, attorney for Illinois Energy Association, FILERS received. [Entry date Feb 22 2005] [SM]
2/18/05	PETITIONER Illinois Energy Association, Form C/A filed, with proof of service. [Entry date Feb 22 2005] [SM]
	* * *

United States Court of Appeals
for the Second Circuit

Non-Duplicative Relevant Docket Entries for
Docket No. 04-6699-ag

Date Filed	Docket Text
12/28/04	Case Docketed: Petition for review of agency order on behalf of PETITIONER Riverkeeper, Inc., filed. [Entry date Jan 21 2005] [SM]
	* * *
12/28/04	Papers from The United States Court of Appeals for the Second Circuit, received. [Entry date Jan 21 2005] [SM]
12/28/04	Certified copy of the United States Court of Appeals for the Second Circuit docket entries FILED. [Entry date Jan 21 2005] [SM]
12/28/04	Note PRIOR case number: 04-4059-ag. [Entry date Jan 26 2005] [SM]
	* * *
3/1/05	Notice of appeal acknowledgment letter from Reed Super FILERS received. [Entry date Mar 2 2005] [SM]
	* * *

41 FEDERAL REGISTER 17,387 (April 26, 1976)

Title 40—Protection of the Environment

CHAPTER 1—ENVIRONMENTAL PROTECTION AGENCY

[FRL 528-6]

PART 401—GENERAL PROVISIONS

PART 402—BEST TECHNOLOGY AVAILABLE FOR THE LOCATION, DESIGN, CONSTRUCTION, AND CAPACITY OF COOLING WATER INTAKE STRUCTURES FOR MINIMIZING ADVERSE ENVIRONMENTAL IMPACT

On December 13, 1973 notice was published in the FEDERAL REGISTER (38 FR 34410), that the Environmental Protection Agency (EPA or Agency) was proposing regulations concerning determinations to insure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

The purpose of this notice is to establish final regulations regarding cooling water intake structures by amending 40 CFR Chapter I, Subchapter N, Part 401 and by adding a new Part 402. This final rulemaking is promulgated pursuant to sections 301, 306, 316(b) and 501(a) of the Federal Water Pollution Control Act, as amended, (the Act); 33 U.S.C. 1311, 1316, 1326(b) and 1261(a); 86 Stat. 816 et seq.; Pub.L. 92-500.

Section 316(b) of the Act requires that "any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."

The regulations set forth below amend 40 CFR Part 401 (General Provisions) and establish a new part 402. The General Provisions set forth in Part 401 were published on February 4, 1974 (39 FR 4532).

Section 401.14, which is added to Part 401 by these regulations, provides that the location, design, construction and capacity of cooling water intake structures for any point source for which a standard is established pursuant to section 301 or 306 shall reflect the best technology available for minimizing adverse environmental impact in accordance with the provisions of Part 402.

Section 402.10 establishes the applicability of the provisions of Part 402. Section 402.11 provides definitions for several of the significant statutory terms which appear in Section 316(b) of the Act.

Section 402.12 provides that the information contained in the Development Document accompanying these regulations is to be used in determining compliance with the statutory standard.

The regulations as proposed were supported by a document entitled "Development Document for Proposed Best Technology Available for Minimizing Adverse Environmental Impact of Cooling Water Intake Structures." (December, 1973). This document was made available to the public and circulated to

interested persons at approximately the time of publication of the notice of proposed rulemaking.

Interested persons were invited to participate in the rulemaking by submitting written comments within 30 days from the date of publication. Because of delays in the printing of the supporting Development Document beyond the Agency's control, the period for public comment was extended an additional 90 days in order to afford a full opportunity to interested parties to participate fully in the rulemaking process (39 FR 4487). Prior public participation in the form of solicited comments and responses from the States, Federal agencies, and other interested parties were described in the preamble to the proposed regulation. The EPA has considered carefully all of the comments received and a discussion of these comments with the Agency's response thereto follows.

(a) Summary of Major Comments.

The following responded to the request for written comments which was contained in the preamble to the proposed regulations: Natural Resources Defense Council, Inc.; Duke Power Company; Shell Oil Company; Manufacturing Chemists Association; United States Atomic Energy Commission; United States Department of the Interior; Quirk, Lawler and Matusky Engineers; Indianapolis Power and Light Company; New York State Department of Environmental Conservation; State of Michigan Department of Natural Resources; National Oceanic and Atmospheric Administration; Tennessee Valley Authority; State of California–State Water Resources Control Board; Commonwealth Edison Company; Texas Electric Service Company; Consolidated Edison Company of New York, Inc.; Salt River Project; Otter

Tail Power Company State of New York Public Service Commission; Illinois Power Company; The Great Western Sugar Company; Edison Electric Institute; State of New Hampshire Fish and Game Department; Union Carbide Corporation; Texaco, Inc.; Mobil Oil Corporation; New York Power Pool; United States Department of Health, Education, and Welfare; Colorado Department of Public Health; Texaco, Inc.; Northern Indiana Public Service Company; New England Power Company; State of New York Department of Law; Debevoise and Liberman. The following is a summary of the significant comments and the Agency's response to those comments.

(1) Several commenters recommended that the regulations provide that the "best technology available" be determined on the basis of an assessment of the cost of applying a particular technology in relation to the benefits to be attained.

No comparison of monetary costs with the social benefits of minimizing adverse environmental impacts, much less a formal, quantified "cost/benefit" assessment is required by the terms of the Act. The statute directs the Agency to insure that enumerated aspects of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. Once such adverse effects have been identified (or, in the case of new structures, predicted) then the effort must be to select the most effective means of minimizing (i.e., "reducing to the smallest possible amount or degree") those adverse effects. The brief legislative history of section 316(b) states that the term "best technology available" contemplates the best technology available commercially at an economically practicable cost. As

with the statute, this language does not require a formal or informal "cost/benefit" assessment. Rather, the term "available commercially at an economically practicable cost" reflects a Congressional concern that the application of "best technology available" should not impose an impracticable and unbearable economic burden on the operation of any plant subject to section 316(b). Since the regulations require a case-by-case determination of the best available technology, consideration of the economic practicability of installing that technology must necessarily be conducted on a similarly individualized basis.

(2) Several commenters recommended that the Development Document include specific consideration of the age of facilities and other pertinent factors which bear upon the degree to which costs are reasonable for particular establishments. Others suggested that the Agency explicitly distinguish among the types of technology considered the best available on the basis of the nature of the water body on which the plant is located and the percentage of flow withdrawn.

Section 316(b) requires "that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." Decisions relating to the best technology available are to be made on a case-by-case basis and may include factors such as age. The Development Document for Cooling Water, Intake Structures contains information to be used in determining the best technology available. The Development Document accompanying effluent limitations and new source performance standards for particular industrial categories may be referred to for other factors specific to point sources within that

category which may be relevant to consideration of economic practicability. The potential for adverse environmental effects associated with cooling water systems may depend upon such factors as size and type of water body and relative magnitude of flow withdrawn for cooling. The Agency expects such factors to be considered in determining the appropriate cooling water technology.

(3) Several commenters recommended that the construction technology information be deleted from the Development Document because its consideration by EPA would duplicate the actions of the U.S. Army Corps of Engineers.

The regulations of the Corps of Engineers primarily relate to hazards to navigation. The data in the Development Document concerning construction technology address factors related to "minimizing adverse environmental impact" of cooling water intake structures and therefore supplement rather than duplicate the actions of the Corps of Engineers.

(4) Some commenters recommended that the Agency identify closed cycle or recirculating cooling systems as the best technology available for minimizing adverse environmental impact. Others recommended that, at least for steam electric powerplants located in estuaries and biologically important coastal areas the "best technology available" is closed cycle cooling, since minimization of cooling water intake capacity (volume of flow) is the most practical currently available means for minimizing mortality of marine species in passage through the internal cooling systems of these plants.

The Agency does not believe that closed cycle cooling systems are universally and necessarily the best technology available despite their undoubted and

dramatic reduction in rates of water used. While the extent of entrainment and impingement damage is in many cases correlated with the amount of water withdrawn, the Agency believes that the appropriate technology is best determined after a careful evaluation of the specific aspects at each site. Moreover, because of the substantial cost of conversion to closed cycle cooling systems, its economic practicability will depend upon considerations relating to individual industrial plants which are, again, most effectively analyzed on a case by case basis.

While there is substantial evidence for concern about the potential destructive effects of open-cycle cooling systems on powerplants in biologically sensitive areas such as estuaries, the available data corresponding to certain of these plants do not support a blanket requirement that all similarly situated plants reduce the capacity of their intake structures so as to require conversion to recirculating cooling systems.

(5) One commenter observed that the cost of modifying an existing intake structure to comply with certain specifications will generally exceed the cost of designing and constructing a new intake structure to those standards. On this basis, it is urged that the Agency expressly provide that an existing structure which has minimal environmental impact "reflects" the "best technology" regardless of whether its design, location and capacity conform precisely to the related criteria set forth in the Development Document.

The Agency recognizes that the cost of modification to existing structures may exceed that of constructing a new intake structure to comparable standards. The Agency expects that higher costs associated with "retrofitting" existing structures, as well as the

relationship of those costs to the remaining expected useful life of the facility, will be taken into account in determining the extent to which the specific technological measures described in the Development Document are available at an "economically practicable cost."

(6) Some commenters recommended that the Development Document should provide that the proper test for minimizing adverse environmental impact is related to damage to the aquatic ecosystem and not to the number of fish and other aquatic organisms killed or damaged.

Section 316(b) requires that the best technology available be used to minimize adverse environmental impacts. As noted in the Development Document, there are many factors that should be considered when determining whether an adverse environmental impact exists or is likely to exist. The factors noted by the commenters are among those to be considered. All pertinent factors, rather than reliance on a single factor, should receive adequate consideration.

(7) Some commenters recommended that the regulations should not establish nationally uniform deadlines for compliance.

Inasmuch as the available technologies of cooling water intake structures for minimizing adverse environmental impact, as well as effluent thermal control system characteristics governed by section 316(a) of the Act, are closely related to the capacity (volume of flow) and other features of the cooling water intake system, the practicable implementation of requirements concerning intake structures and effluent heat should consider both requirements. Therefore, compliance dates should be determined on a case-by-

case basis taking into consideration any compliance dates for limitations on the discharge of heated effluent and other pertinent factors.

(8) Some commenters recommended that the regulations should refer independently to entrainment damage or that the Development Document should be enlarged to cover harm from entrainment. A countervening recommendation submitted by some commenters was that the regulations apply only to the physical intake structures themselves and not to entrainment damage within other parts of the cooling system.

The terms of the Act and the legislative history related to section 316(b) indicate that the best technology available for cooling water intake structures be used for minimizing any adverse environmental impact. The Development Document has been enlarged to include factors relating to the entrainment problem which, as commenters noted, is of environmental concern, and which realistically cannot be separated from intake structure capacity or location.

(9) A commenter recommended that the time period be identified over which the percentage of flow atributable to cooling is to be calculated.

The definition of the term "cooling water intake structure" indicates that the major portion of the water directed through the structure is to absorb waste heat. An adequate period of time should be used to minimize short term water use variations. This period of time should be at least twelve months, except where shorter periods are warranted.

(10) One commenter criticized the omission of energy penalties associated with operation of some closed cycle cooling systems and suggested that the

Agency should address this cost as well as the capital costs of construction.

The Agency has undertaken an economic analysis of the regulations in response to this comment and in order to assess the potential economic effects of installing the best available cooling water technology on intake structures at electric powerplants—which are the largest industrial users of cooling water. This analysis addresses the energy and capacity loss costs of closed cycle cooling, assuming that these systems were to be required. The analysis is necessarily tentative since the regulations do not attempt to establish rigid rules governing the selection of best technology available. Nevertheless, the analysis indicates that even under conservative assumptions of the number of plants affected, the increase in energy (fuel) consumption is less than one half of one percent of total fuel consumption by the power industry.

(11) It was suggested that the information and data collection requirements for the intake structure determinations under section 316(b) be coordinated with those of section 316(a) which addresses the environmental effects of heat in the discharge of cooling water.

The Agency agrees that duplication in the collection of biological and hydrological data should be avoided. To the extent that relevant data are assembled in connection with 316(a) proceedings, or other studies, they should be used in making determinations pursuant to section 316(b). However, the Agency rejects the related suggestion that a determination under section 316(a) that thermal component of a discharge will not disrupt the balanced indigenous aquatic community in the receiving waters should be conclusive for purposes

of 316(b). In some cases, the data available in 316(a) proceedings will not be sufficient to make a judgment as to 316(b) concerns. Even where the data are complete, however, the conclusion in a 316(a) hearing should not necessarily govern the outcome of 316(b). Certainly, the Agency would not deny a request for less stringent thermal effluent limitations under 316(a) where the necessary statutory showing had been made because of entrainment effects of the plant's intake structure. Similarly, the Agency should not be precluded from addressing evident entrainment problems simply because the plant's thermal effluent is not itself environmentally unacceptable. The concerns of the two sections are different and the legal standards by which compliance with their requirements is to be judged are similarly distinct.

(b) Revision of the proposed regulation prior to promulgation.

As a result of public comment and a continuing review and evaluation of the proposed regulation by EPA, the following changes have been made in the regulations.

The terms "location," "design," "construction," and "capacity" have been defined. Also, the effort to make an explicit distinction between new and existing intake structures has been deleted because the proposed regulation was unclear. Nevertheless, as indicated above, the Agency does consider the age of an intake structure to be a relevant factor and anticipates that it will be taken into account in the determination of best technology available.

(c) Economic impact.

Cost data for construction of various cooling water intake structure modes are included in the

Development Document. An analysis of the projected economic effects of the regulation on the electric power industry, the segment most likely to be significantly impacted by these regulations, has been prepared and is available from the Agency upon request. The inflationary impact of these regulations has, as that analysis indicates, been evaluated in compliance with Executive Order No. 11821 and OMB Circular A-107.

(d) Final rule making.

In consideration of the foregoing, 40 CFR Chapter I, Subchapter N, Part 401 is hereby amended and a new Part 402 is established to read as set forth below, to be effective May 26, 1976.

Dated: April 16, 1976.

RUSSELL E. TRAIN,
Administrator.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

DECISION OF THE GENERAL COUNSEL

In re Brunswick Steam Electric Plant

June 1, 1976

EPA GCO 41

In the matter of the National Pollutant Discharge Elimination System Permit for Brunswick Steam Electric Plant, Permit No. NC0007064, Southport, North Carolina, the presiding officer has certified four issues of law to the General Counsel for decision pursuant to 40 C.F.R. § 125.36(m). The parties, having had the opportunity to provide written briefs in support of their respective positions, present the following issues:

QUESTION PRESENTED

Timing of Imposition—July, 1981, Guideline Data — Can "best technology available" requirements be imposed under § 316(b), and thus under § 301, prior to the July 1, 1981, date specified in 40 C.F.R. § 423.13(m) for compliance with § 301 thermal effluent limitations?

DECISION

Insofar as § 316(b) addresses a different environmental problem in a different manner than the

§ 301 thermal effluent limitations, § 316(b) determinations are independent of determinations under the thermal effluent limitations. Furthermore, the July 1, 1981, date in 40 C.F.R. § 423.13 was set on the basis of the overall ability of the Steam Electric industry to construct the best available technology—closed cycle cooling systems. Since § 316(b) does not establish a uniform "best technology available", it would be inappropriate to establish a uniform date under § 316(b).

Insofar as neither § 316(b) nor the regulations thereunder specify a time limitation for the application of best technology available, the ultimate compliance date under § 316(b) is governed only by § 301(b)(2)(A) which requires compliance not later than July 1, 1983. Therefore, best technology available under § 316(b) may be imposed in NPDES permits, on a case by case basis, prior to July 1, 1981, so long as the prescribed technology is, in fact, available by the compliance date.

DISCUSSION

Carolina Power and Light Company's (CP&L) argument that best technology available under § 316(b)[1] cannot be imposed until July 1, 1981, (the date, for compliance with thermal effluent limitations) rests on a misapprehension of the relationship between § 316(b) and thermal effluent limitations under § § 301 and 306. CP&L's argument assumes that § 316(b) determinations and thermal effluent limitation

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[1] Section 316(b) states:

Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

decisions under § § 301 and 306 are interdependent and that § 316(b) requirements "ride on the coattails of § 301 effluent limitations." (CP&L's Brief on Issues of Law Referred to the Office of General Counsel, at 13.) Given this assumption, CP&L asserts that § 316(b) determinations are bound by the July 1, 1981, statutory date of compliance with the thermal effluent limitations contained in the Steam Electric Power Generating Point Source Category regulations prescribing "best available technology". (40 CFR Part 423; 39 F.R. 36186, October 8, 1974).

CP&L's underlying assumption that § 316(b) determinations are dependent upon thermal effluent standards is misconceived. First, § 316(b) does not establish effluent limitations for discharges of heat. Rather, it addresses a distinct environmental problem—the withdrawal of massive volumes of water and the aquatic organisms therein through cooling water intake structures. Second, the regulations under § 316(b)[2], unlike the thermal effluent regulations, do not establish a single industry-wide "hest available, technology" standard. That is, the Steam Electric regulations require that *all* plants within specified categories in the industry must attain prescribed thermal effluent limitations by July 1, 1981. Conversely, the § 316(b) regulations do not prescribe a single technology or technologies which all sources in the country must apply.[3] The preamble to § 316(b) regulations states that "the Agency believes that the appropriate technology is best determined after a careful evaluation of the specific aspects at each site."

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[2] 40 C.F.R. 401.14, 402.10, 402.11, 41 F.R. 17389-90, April 26, 1976.

[3] 41 F.R. 17388.

Third, unlike the thermal effluent regulations, the § 316(b) regulations do not establish a date for compliance with "best technology available." Thus, § 316(b) determinations are bound only by § 301(b)(2)(A) which requires that effluent limitations shall require compliance with best available technology economically achievable not later than July 1, 1983. As CP&L concedes.

EPA has authority to advance the statutory deadline in NPDES permits where regulations do not otherwise establish a compliance date.[4]

Under § 316(b) the best technology available must, of course, be available. In other words, a compliance schedule under the § 316(b) regulations must take into consideration the time necessary to implement the appropriate technology at a given intake structure.[5]

In some cases, the implementation of such technology may require only modest alterations in design, for example, which could easily be completed well in advance of 1981. There is no need to delay the attainment of § 316(b)'s mandate until that date by mechanistic reference to unrelated sections of the law. In other cases, best technology available under § 316(b) may entail substantial changes in cooling water intake structures and associated cooling system alterations. It may not be feasible to make these changes by 1981 in

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[4] Decision of the General Counsel No. 11, at 3; Decision of the General Counsel No. 23, at 9.

[5] The capacity of a cooling water intake could be restricted under 316(b) so as to necessitate the construction of a closed cycle cooling system. If so, a compliance schedule for such a restriction should be coordinated with any independent requirement for the installation of a closed-cycle cooling system under the Steam Electric guidelines.

certain instances. Thus, the benefits of a flexible case-by-case § 316(b) implementation schedule cut both ways.

QUESTIONS PRESENTED

Type of Control Technology—Can Cooling Towers Be Required—Does § 316(b) of FWPCA allow imposition of closed-cycle cooling requirements since such requirements relate not to the locations, design, construction and capacity of the cooling water intake structures themselves, but rather to the type of cooling system and its thermal discharge technology?

DECISION

Section 316(b) authorizes the reduction of the volume (capacity) of cooling water withdrawn through a cooling water intake structure if such a reduction reflects the best technology available for minimizing adverse environmental impact. Such a reduction of allowable capacity may necessitate the use of a closed cycle or recirculating cooling system. Section 316(b) does not, however, allow for the imposition of closed cycle cooling systems *per se*.

DISCUSSION

Section 316(b) provides that "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The major adverse environmental impacts of cooling water intake structures are those affecting aquatic organisms living in the volumes of water withdrawn through the intake

structure.[6] Generally, the organisms are "damaged either through direct contact with the intake structure (impingement) or through "inner plant" effects which occur when the organisms are swept through the intake structure and into the plant itself (entrainment). One means of minimizing entrainment damage in particular is to restrict the capacity of the intake structures and thus the volume of water withdrawn through the intake system. In this manner, the overall exposure of aquatic organisms to entrainment effects may be reduced.[7]

CP&L, however, asserts that the term "capacity" refers only to the velocity of water withdrawn through an intake structure. To the contrary, it seems clear to me that the term "capacity" in § 316(b) means the volume of water withdrawn through a cooling water intake structure. This conclusion is supported by the commonly understood meaning of the term "capacity"[8] the definition of the term in the regulations under § 316(b)[9] and the legislative history of the Federal Water Pollution Control Act Amendments of 1972.

In the course of debating the conference report of the Act on October 4, 1972, the Senate was well aware of the dangers posed to aquatic life by the withdrawal

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[6] In the Steam Electric industry, the volumes of water drawn through plants utilizing "once through" cooling systems are generally very large. Senate Com. on Pub. Works. A Legislative History of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Session, at 196-197 (1973). (Hereinafter cited as Leg. Hist).

[7] 41 F.R. 17388, April 26, 1976.

[8] The Random House Dictionary of the English Language defines capacity (definition 2) as "cubic contents; volume; that which can be contained." (Unabridged 1970).

[9] 40 C.F.R. 402.11(c), 41 F.R. 17390, April 26, 1976.

of large volumes of water through cooling water intake structures.[10] In response to concerns voiced by Senator Buckley that the Act would prevent the effective regulation of this problem, Senator Muskie, the Chairman of the Senate Conference Committee, stated that EPA had authority under the Act to regulate the withdrawal of cooling water so as to minimize adverse environmental aspects.[11]

In this context, it is clear that Congress sought to give EPA authority to regulate the volume of water withdrawn through cooling water intake structures, and that Congress was concerned that EPA should do so where necessary to protect aquatic communities. In short, the term "capacity" must be interpreted to mean the "volume of flow" through a cooling water intake structure so as to be consistent with the dictionary definition of the term, the regulations under § 316(b), and the intent of Congress.

Thus, it does not make sense to define the term "capacity" in terms of the physical size of the inlet opening of the intake structure as urged by CP&L. First, as noted by CP&L, the size of the inlet determines only the velocity of the water withdrawn,

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[10] During debate, Senator Buckley cited—with approval—two newspaper articles which reported a decision of the Atomic Energy Commission (AEC) to require Consolidated Edison Company to install a closed cycle cooling system at its nuclear power plants at Indian Point on the Hudson River. The articles pointed out that plants withdrew massive amounts of water from the River and, as a result, also withdrew thousands of aquatic organisms each minute. In order to minimize this adverse environmental impact, the articles noted that the AEC had ordered Consolidated Edison Company to stop removing such large volumes of water from the River and to install cooling towers in order to do so. Leg. Hist., *supra* n. 6., at 196-197.

[11] *Id.* at 197-198.

not the volume. Although velocity (and volume) is an important factor in the impingement of larger fish, velocity is not important with respect to the entrainment of smaller organisms. Rather, the volume withdrawn is the principal determinant of entrainment damage which is the major adverse environmental effect associated with most cooling intake structures. (41 F.R. 13788, April 26, 1976).

Second, the Random House Dictionary of the English Language (Unabridged, 1970 Edition) defines "capacity" as "cubic contents; volume; that which can be contained." CP&L's definition of "capacity," then, would prevent EPA from solving a problem which Congress clearly wanted EPA to solve, and it also is contrary to the established definition of the term "capacity."

CP&L also argues that closed cycle cooling technology may only be imposed on the basis of thermal discharge effluent limitations. The definition of cooling water intake structures in the regulations under § 316(b) does not encompass cooling systems.[12] Inasmuch as the scope of § 316(b) only extends to the location, design, construction and capacity of *intake structures*, a closed cycle cooling system *per se* cannot be imposed under § 316(b).

However, CP&L also implies that closed cycle cooling may not be imposed even *indirectly* under § 316(b). That is, CP&L seems to argue that the capacity of a cooling water intake structure may not be restricted under § 316(b) so as to necessitate a closed cycle cooling system. Such an interpretation of § 316(b) is clearly contrary to the Congressional intent

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[12] 40 C.F.R. 402.11(a), 41 F.R. 13789-17390, dated April 26, 1976.

underlying § 316(b), see discussion *supra*, and would upset the overall framework of § 316.

As discussed in terms of Issue I, § 316(b) and thermal effluent limitation standards require independent determinations. Section 316(b) is concerned with the adverse environmental impact of the *withdrawal* of cooling water rather than the discharge of heated water. The § 316(b) standard is whether the cooling water intake structure reflects the best technology available for minimizing adverse environmental impact rather than whether the discharge exceeds a thermal limitation or whether the discharge interferes with the propagation of a balanced indigenous population of shellfish, fish, and wildlife.[13]

In sum, although § 316(b) does not authorize the Agency to impose a specific closed cycle cooling technology, it does authorize the restriction of the capacity of an intake structure. Such a restriction may necessitate a closed cycle cooling system. This result is not inconsistent with Agency restrictions on the volume of pollutant discharge under § § 301 and 306. That is, while the Agency cannot specify abatement technologies to be employed under those sections, the use of a particular treatment system may be a predictable consequence of the limitation imposed on the discharge of specific pollutants.

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[13] Thus, the one-standard approach to § 316 urged by Carolina Power and Light was clearly rejected by Congress. In fact, the original House version of § 316 more or less combined § 316(a) and § 316(b) considerations in one standard, but this approach was abandoned in the final conference version of the Act. If Congress had intended to limit § 316(b) determinations to the confines of existing thermal discharge technologies, it could have enacted the House version of § 316 or otherwise linked a determination under § 316(a) to a determination under § 316(b).

QUESTION PRESENTED

Can an NPDES Permit Require Cooling Towers As Such—May the NPDES permit specify use of a particular control technology—in this case closed-cycle cooling towers—or must cooling water intake structure requirements be limited to meeting an established level of environmental performance which is directly related to the degree of significant adverse environmental impact found to be caused by the existing intake structure?

DECISION

An NPDES Permit may specify restrictions on the location, design, construction, and capacity of a cooling water intake structure. A permit may not, as the Region contends, specify a particular closed cycle cooling system technology. On the other hand, a permit need not, as CP&L urges, contain a "performance standard" expressed in terms of the amount of environmental harm to be avoided by compliance with § 316(b). Rather, restrictions under § 316(b) need only reflect the best technology available for minimizing adverse environmental impact.

DISCUSSION

Section 316(b) requires that the "location, design, construction and capacity of cooling water intake structure reflect the best technology available for minimizing adverse environmental impact." Cooling towers or other closed cycle cooling systems are not cooling water intake structures. It is clear that there is no independent basis under § 316(b) to require a cooling tower in a permit. However, under § 316(b) a permit may restrict the volume of flow or capacity of an intake structure. If the capacity of an intake

structure is so restricted, the adverse environmental impact of the intake structure will have been minimized to a given level regardless of whether the company installs a cooling tower. That is, the limitation on intake volume -- not the cooling towers -- protects the endangered aquatic organisms. Cooling towers are an issue only to the extent that a point source may have to install a closed cycle cooling system in order to maintain existing operations if the permit restricts the volume of previously "once-through" cooling water.

Finally, the statute does not require that these cooling water intake structure regulations be expressed in terms of a level of performance which specifies the degree of adverse environmental impact, attributable to the intake structure, which is tolerable. Nor is it clear how compliance with a standard so expressed could effectively be monitored and enforced. The structures must reflect the best technology available for *minimizing* (i.e., "reducing to the smallest possible amount or degree")[14] adverse environmental impact -- significant or otherwise. All environmental harm should be avoided, but the continued operation of a facility will, in most cases, prevent this result. Under § 316(b), EPA s confined to the establishment of technical parameters governing the optimal location, design, construction and capacity of intake structures.

In other words, the goal of best technology available under § 316(b) is to minimize all adverse environmental impacts—not to reduce the impact to a pre-determined level. CP&L's argument to the contrary obscures the critical fact that § 316(b) does

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[14] Random House Dictionary of the English Language, (Unabridged 1970).

not establish effluent limitations. Rather, § 316(b) *conditions* effluent limitations established pursuant to § § 301 and 306. As such, CP&L's citations to the definition of effluent limitations are misleading. While it is true that an effluent limitation regulates the *performance* which must be achieved and not the technology (CP&L Brief, at 27), § 316(b) specifically regulates enumerated aspects of *cooling water intake structures* rather than the makeup of the intake water.

Accordingly, whereas an NPDES permit may not specify closed cycle cooling systems as best technology available under § 316(b), a permit may specify a particular location, design, construction technique, or capacity for a cooling water intake structure as best technology available.

QUESTION PRESENTED

Is a permittee estopped from contesting the cooling tower requirements of an NPDES permit when said permittee agreed to install such devices by stipulation in settlement of a case before the NRC involving the same facility where the EPA was not a formal party to such proceedings?

DECISION

The permittee is not estopped from contesting the NPDES permit proceeding at issue as the merits of the Stipulation between NRC and the permittee were not actually adjudicated.

DISCUSSION

Collateral estoppel and res judicata apply only to administrative actions which are actually adjudicated.[15] Insofar as the Stipulation between NRC and CP&L was not a result of an adjudication of the merits of the issue but rather represented a pre-adjudicatory settlement, it is not appropriate to apply the principles of collateral estoppel or res judicata against CP&L in this proceeding.[16]

The spectacle of a major power company renouncing the environmental responsibilities embodied in its voluntary agreement with NRC to construct a cooling tower at its Brunswick plant is an unpleasant one. Nevertheless, since an essential prerequisite to the application of res judicata and collateral estoppel is not here present, I do not believe the company should be totally precluded from presenting its case to EPA. See *Grose v. Cohen*, 406 F.2d 823, 824-5 (C.A. 4 1969).

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[15] Davis, *Administrative Law Treaties*, § 18.03, at 558; § 18.08, at 597 (1958).

[16] See, Decision of the General Counsel No. 33, at 4. It should be noted that the Stipulation provided that:

Nothing in this Stipulation shall affect any authority of the Environmental Protection Agency.

JA-63

1 E.A.D. 332, 1977 WL 22370 (E.P.A.)

United States Environmental Protection Agency
(E.P.A.)
Environmental Appeals Board

IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, ET AL.
(SEABROOK STATION, UNITS 1 AND 2)
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM permit

National Pollutant Discharge Elimination System

Application No. NH 0020338
Case No. 76-7

June 10, 1977

DECISION OF THE ADMINISTRATOR

This is a decision on Appeal from the Initial Decision ("I.D.") of the Regional Administrator ("RA") of Region I of the Environmental Protection Agency ("EPA" or the "Agency") dated November 9, 1976. For the reasons set forth below, the I.D. is reversed.

This matter has received extraordinary attention from the press and the public, because of the public debate concerning whether a nuclear plant should be built at a location such as that chosen by the Public Service Company for the Seabrook Station. I think it is important to emphasize that the Agency has played a very narrow role in the process of governmental approval of this nuclear power plant. The Agency's

function in this case is to determine whether the proposed thermal discharge will assure the protection and propagation of a balanced, indigenous population of fish, shellfish and wildlife in and on the receiving waters, and to determine whether the intake structures reflect the best technology available for minimizing adverse environmental impact. This decision should not be interpreted as representing EPA policy on either nuclear power or the overall environmental desirability of the Seabrook plant.

I. Background

A. Procedural Setting

On August 1, 1974, Public Service Company of New Hampshire ("PSCo"), on behalf of itself and the owners of a nuclear electric generating station proposed to be constructed in Seabrook, New Hampshire, filed with Region I an application for an NPDES permit pursuant to Section 402 of the Federal Water Pollution Control Act, as amended ("FWPCA"), 33 U.S.C. §1251 et seq. Because the applicable regulations as then proposed (39 F. R. 8294) and later promulgated (40 C.F.R. Part 423) would require no discharge of heat from the main condensers, with certain limited exceptions, PSCo requested the imposition of a less stringent thermal standard pursuant to Section 316(a) of FWPCA. The filing of the application also brought into play the provisions of Section 316(b) of FWPCA, which require that the location, design, construction and capacity of the cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

PSCo also had pending at the time applications for

construction permits filed in July, 1973 with the United States Atomic Energy Commission ("AEC"), now the United States Nuclear Regulatory Commission ("NRC"), pursuant to the Atomic Energy Act of 1954, as amended. The NRC exercises responsibilities both under that Act and under the National Environmental Policy Act of 1967 ("NEPA"). Action on PSCo's applications proceeded concurrently before the AEC and EPA. In November, 1974, EPA and the AEC published a proposed Second Memorandum of Understanding Regarding Implementation of Certain AEC Responsibilities (39 F.R. 39491, November 7, 1974) ("Proposed Second Memorandum"), which amplified the procedures for coordinating their NEPA and FWPCA responsibilities.

In Paragraph 5 of the Proposed Second Memorandum, EPA agreed to use its best efforts to evaluate impacts on water quality and biota pursuant to Sections 402 and 316 of FWPCA and to complete cooling water intake structure evaluations pursuant to Section 316(b) as far as possible in advance of AEC's issuance of a construction permit. For this purpose EPA undertook to develop regulations establishing a procedure for issuance to the applicant, where appropriate, of "preliminary determinations" specifying the terms and conditions proposed for an NPDES permit pursuant to Sections 316(a) and (b). Paragraph 5 acknowledged that the purpose of the preliminary determinations was to assure, to the extent possible, that considerations regarding impacts on water quality and biota would not result in the need for significant changes in plant design or location subsequent to the completion of AEC's environmental review.

Region I held a public hearing on the application on January 30, 1975 in Seabrook, New Hampshire. Thereafter, no regulations providing for issuance of "preliminary determinations" having been issued by the Agency, on June 24, 1975 Region I issued Determinations concerning Section 316(a) and (b) "procedurally by analogy" to the NPDES and Section 316(a) regulations. These Determinations in effect approved of once-through cooling for Seabrook on certain conditions, but did not specify the location of the intake structure. On October 24, 1975, Region I issued Determinations specifying the location of the intake structure.

The Seacoast Anti-Pollution League and the Audubon Society of New Hampshire (collectively referred to herein as "SAPL") filed requests for adjudicatory hearings with respect to both Determinations as provided in 40 C.F.R. §125.36. The requests were granted by the RA. Thereafter PSCo and the Attorney-General of New Hampshire ("NHAG") requested admission as parties. The hearings were consolidated and held between March 23 and April 2, 1976. The record was certified by the Administrative Law Judge to the RA on May 21, 1976, in accordance with 40 C.F.R. §125.36(1)(1). On November 9, 1976 the RA issued the I.D., in which he revoked the Determinations. PSCo then filed a Petition for Review with the Administrator. On December 7, 1976 the Administrator granted PSCo's Appeal on two issues: the impact of the thermal discharge and the intake design and location. The Administrator stated that PSCo's arguments as to burden of proof were to be presented in the context of these issues.

Briefs were filed on January 6, 1977 by PSCo and by amici curiae Appalachian Power Company, et al. (the "Utilities"). Briefs were filed on February 7, 1977 by the EPA, SAPL, and NHAG and by the following amici curiae: the National Wildlife Federation, the New Hampshire Wildlife Federation and the Natural Resources Council of Maine (collectively referred to herein as "NWF"); the Natural Resources Defense Council and the Conservation Law Foundation of New England (collectively referred to herein as "NRDC"); and Meldrim Thomson, Jr., Governor of the State of New Hampshire. In addition, on February 7, 1977 the Utilities moved to file a reply brief, and on February 22, 1977 PSCo moved to file a reply brief. These motions were opposed by SAPL and are discussed below.

Section 125.36(n)(12) of the regulations provides that the Administrator shall decide the matters under review on the basis of the record presented and any other considerations he deems relevant. Because of the complexities of this case I convened a panel of technical and scientific experts to assist in my review of the record. I have considered the advice of these experts in coming to my decision set forth herein. I also requested and received from PSCo a document mentioned in their brief and not included in the record, entitled "Assessment of Thermal Plume Mortality Attributable to Seabrook Station Cooling Water Discharge Off Hampton Beach, New Hampshire." In addition, as mentioned below, on March 23, 1977 I issued a Request for Information with respect to certain aspects of backflushing, and I have considered all information received in response to that request.

B. Factual Setting

The proposed nuclear electric generating facility, Seabrook Station, will consist of two units, one estimated to begin operation in 1981 and the other in 1983. It will be located in Seabrook, New Hampshire near the Hampton Harbor estuary, about two miles inland from Hampton and Seabrook Beaches (which are on the Gulf of Maine portion of the Atlantic Ocean). As part of the process of generating electricity at the plant, steam which has passed through the turbines must be condensed. Condensing the steam requires the removal of heat and the rejection of this heat to the environment by some type of cooling system. The quantity of heat which must be rejected each hour is 16 x 10^9 BTU, which is the amount of heat that would be obtained from 113,465 gallons of No. 2 fuel oil.

The Seabrook Station condenser cooling water system is called a "once-through" system because there is neither recirculation of cooling water nor any supplementary cooling device, such as a cooling tower or pond. Cold water from the ocean will be drawn into a tunnel through a three-structure intake, at the rate of 824,000 gallons per minute (gpm). The water will flow to the plant, where it will remove heat by conduction through the condenser tubes. At full power, the temperature of this condenser cooling water will increase by approximately 39°F. (The difference between the temperature of the water as it is drawn into the intake and the temperature of the water after it has been heated by passing through the condenser tubes is referred to as the delta-T.) The water will then flow back through another tunnel to a submerged multi-port diffuser where it will be discharged into the

ocean. The quantity of heated water discharged will average 1,187,000,000 (approximately 1.2 billion) gallons per day.

The Seabrook Station would have the highest delta-T of any steam electric generating station now operating in the United States; several stations have higher volume. PSCo states in its Brief (at p. 6) that:

> This high delta T was deliberately chosen in consultation with the marine biologists advising PSCo in order to minimize the volume of water which must be utilized for cooling purposes. This choice was made on the theory that inasmuch as the long travel times and substantial pressure changes necessitated by the use of open ocean, as opposed to estuarine, cooling water coupled with the normal mechanical and chemical effects of any condenser would result in significant (if not total) mortality to entrained organisms, the way to minimize entrainment mortality was to minimize the volume of water utilized. Since the amount of heat to be removed is dictated by the laws of thermodynamics, the only way to reduce the volume of water needed to perform the removal task is to increase the amount of heat removed per unit of water volume, i.e., increase the delta T. Thus, while Seabrook Station will have a delta T that is unusually high, it will take in one-half the water a system having a 20 delta T would, putting at risk one-half the number of entrained organisms.

Seabrook Station would have cooling water intake structures within the meaning of Section 316(b) of FWPCA. The intake will consist of three structures,

each of which is connected to the intake tunnel by a 9-foot diameter riser shaft. Each structure will be circular, with the lower lip being a minimum of 7 feet off the bottom; the top of the structure will be a velocity cap 7 feet above the lower lip; both the lower lip and the velocity cap will have a diameter of 30 feet 6 inches. The three structures will be located 110' apart in a straight line running southeast to northwest. Each structure will take in ocean water at approximately 600 cubic feet per second (cfs), or a total of 1800 cfs, with an entrance velocity of approximately 1 foot per second (fps).

PSCo originally proposed that the intake location should be approximately 3,000 feet east of Hampton Beach in water about 38 feet deep, mean sea level ("MSL"), with the intake openings being approximately 24 feet through 31 feet below the surface, MSL. (This location is herein referred to as the "near site"). In the October 24 Determinations, the Regional Administrator required that the ports be located approximately 4,000 feet northwest of the near site in water approximately 41 feet through 48 feet below the surface, MSL. (This location is herein referred to as the "far site".)

The diffuser through which the cooling water will be discharged will consist of twenty-two nozzles spaced in pairs along a 1000-foot line oriented generally northwest to southeast. The discharge nozzle closest to the shore will be about 5,400 feet east of Hampton Harbor Inlet. The discharge nozzles will be approximately 45 feet below the water surface and seven feet above the ocean floor. The design discharge velocity is 15 fps in a generally eastward direction and

oriented at various angles (either 20° or 25°>>>>>>>>>, depending on the nozzle) above the horizontal.

Another aspect of the condenser cooling system of relevance is the so-called "backflushing" operation to clean the intake tunnel. This consists of reversing the flow of the system once or twice a month so that water is drawn in through the diffuser and is discharged through the intake structures. After flow is reversed, the discharge water is brought to a temperature of 120°F by recirculation through the condenser and held at that temperature, through the entire length of what is normally the intake tunnel, for a minimum of two hours. This procedure is intended to control biofouling in the intake tunnel by killing any organisms which may have settled and grown in the tunnel.

II. Preliminary Matters

A. The Appalachian Power Case

The Agency's effluent limitation guidelines and standards for the Steam Electric Power Generating Point Source Category, 40 CFR Part 423, issued pursuant to Sections 301, 304, 306 and 316(a) of FWPCA on October 8, 1974, were challenged by publicly and privately owned electric generating companies in Appalachian Power Co. v. Train, Civ. Nos. 74-2096 et al., 9 E.R.C. 1033 (4th Cir. 1976). It was these regulations that established closed-cycle cooling as "best available technology economically achievable" (?7FBATEA") under Section 301(b)(2)(A) of FWPCA for plants such as Seabrook.

The plaintiffs argued that the Agency's regulations were invalid because the Agency failed to balance the

overall social benefits to be derived from its regulations against their social costs. While rejecting the contention that benefits derived from a particular level of effluent reduction must be quantified in monetary terms, the court held that the Agency must consider the benefits derived from the application of its effluent reduction requirements in relation to the associated costs of alternative levels of heat reduction in order to determine whether the resulting progress is "economically achievable" and whether the reduction in heat discharged represents "reasonable further progress toward the elimination of pollutants." The court also directed that EPA reevaluate its requirements for closed-cycle cooling at generating units located along the coastline.

The effect of the remand of the steam electric generating guidelines was, as urged by the Utilities, to require the Agency to determine what is BATEA for existing sources on a case-by-case basis under Section 402(a)(1). Since the Appalachian Power opinion was handed down on July 16, 1976, after the issuance of the Determinations and the adjudicatory hearing, the RA was faced with the dilemma of how to treat the decision in the pending 316(a) request for the Seabrook Station. [FN1] The RA seemingly had two choices: he could start from scratch to determine what is BATEA for the Seabrook Station, and then go to the 316(a) determination if the BATEA requirements were more stringent than the applicant's requested 316(a) effluent limitations, or he could simply assume that the reconsidered BATEA standards would be more stringent and that PSCo's 316(a) request would

represent a relaxation from that requirement. The RA chose the latter course.

PSCo urges that this is arbitrary, capricious and contrary to law; it does not, however, suggest what position the RA should have adopted instead. PSCo never requested the RA to make a determination of BATEA under Section 402(a). I find that the RA's assumption was an expeditious and reasonable way of ruling on PSCo's pending application without further delay under the unique circumstances of this case.

B. Nature of Section 316(a) and (b)

The RA discussed the nature of 316(a) and (b) and came to some conclusions which are of interest beyond the circumstances of this case. Because this is the first ruling I have made with respect to Section 316, discussion of these aspects of the RA's decision is merited to provide further guidance to all interested persons as to Agency's interpretation of Section 316.

(1) Consideration of Costs under Section 316(b). The RA followed the Agency policy set out in the preamble to the 316(b) regulations (41 F.R. 1738 et seq.), which provides that the Agency must identify or predict adverse environmental effects and then select the most effective means of "minimizing" (defined in the premable as "reducing to the smallest possible degree") the adverse effects. The preamble interprets "best technology available" to mean "best technology commercially available at an economically practicable cost", based on legislative history, and states that Section 316(b) does not require a formal cost/benefit analysis. However, the RA stated that:

> Determining the degree of minimization required calls for a balancing of costs with the magnitude of the environmental impact to be avoided to achieve a reasonable relationship between the costs of the technology and the magnitude of adverse environmental harm avoided.

The RA and the Agency both take the position that, since the regulations require a case-by-case determination of best available technology, consideration of the economic practicability must also be conducted on a case-by-case basis.

The Utilities argue that cost/benefit balancing is required under Section 316(b) and urge affirmance of the RA's decision insofar as it appears to agree with this position. The Utilities cite DuPont v. Train, 541 F. 2d 1018, 8 ERC 1718 (4th Cir. 1976) and Appalachian Power, supra. In Dupont, the Fourth Circuit held that a cost/benefit analysis was required under Section 304(b)(1)(B) with respect to the determination of what is "best practicable control technology currently available" under Section 301(b)(1)(A); Section 304(b)(1)(B) expressly required the Agency to take into account "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." In Appalachian Power, as discussed above, the Fourth Circuit held that in determining whether its regulations specified "best available technology economically achievable ... which will result in reasonable further progress towards the national goal of eliminating the discharge of all pollutants" under Section 301(b)(2)(A), the Agency must consider the benefits derived from the application of its effluent reduction requirements in

relation to the associated costs to determine whether in fact the resulting progress is "economically achievable" and whether the progress is "reasonable." The Utilities argue that since "best available technology economically achievable" is equivalent to the term "best technology commercially available at an economically practicable cost," Appalachian Power dictates a cost/benefit balancing under Section 316(b).

I believe that neither DuPont nor Appalachian Power is dispositive of the issue and that the Agency's position, that cost/benefit analysis is not required under Section 316(b), is correct. Section 316(b) provides flatly that cooling water intakes shall "reflect the best technology available for minimizing adverse environmental impact." Unlike Sections 301 and 304, Section 316(b) determines what the benefits to be achieved are and directs the Agency to require use of "best technology available" to achieve them. There is nothing in Section 316(b) indicating that a cost/benefit analysis should be done, whereas with regard to "best practicable control technology currently available" and "best available technology economically achievable" Congress added express qualifiers to the law indicating a requirement for cost/benefit analysis. Indeed, but for one bit of legislative history,[FN2] there would be no indication that Congress intended costs to be considered under Section 316(b) at all. I find, therefore, that insofar as the RA's decision may have implied the requirement of a cost/benefit analysis under Section 316(b), it was incorrect.

However, the RA may have meant only that some consideration ought to be given to costs in determining

the degree of minimization to be required. I agree that this is so—otherwise the effect would be to require cooling towers at every plant that could afford to install them, regardless of whether or not any significant degree of entrainment or entrapment was anticipated. I do not believe that it is reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained.

(2) Interdependence of Section 316(a) and (b). The RA ruled that a determination of the effect of the thermal discharge cannot be made without considering all other effects on the environment, including the effects of the intake (i.e., entrainment and entrapment); the applicant must persuade the RA that the incremental effects of the thermal discharge will not cause the aggregate of all relevant stresses (including entrainment and entrapment by the intake structure) to exceed the 316(a) threshold. I believe this is the correct interpretation of Section 316(a). The effect of the discharge must be determined not by considering its impact on some hypothetical unstressed environment, but by considering its impact on the environment into which the discharge will be made; this environment will necessarily be impacted by the intake. When Congress has so clearly set the requirement that the discharge not interfere with a balanced indigenous population, it would be wrong for the Agency to put blinders on and ignore the effect of the intake in determining whether the discharge would comply with that requirement.

The Utilities argue that the Agency has recognized the independence of 316(a) and (b) in the preamble to the regulations, which states that the "concerns of the two

sections are different and the legal standards by which compliance with their requirements is to be judged are similarly distinct" (41 F.R. 17389). As SAPL points out, the fact that the legal standards of the two sections are different does not mean that factual aspects of the intake may not be considered in making a legal conclusion about the discharge.

The RA also ruled that, as a matter of sound statutory interpretation and good policy, an intake structure would not (as a threshold matter) be "minimizing" adverse environmental impacts if, for example, its entrapment and entrainment effects (examined in the context of all projected stresses on the environment) would interfere adversely with "the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife." I find it unnecessary to rule whether this interpretation is correct because I have determined that the intake structures (examined in the context of all projected stresses on the environment) will not interfere with "the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife."

Finally, the RA ruled that even if entrainment and entrapment effects would not cause an "imbalance" they must be "minimized." This is in accord with Agency policy that "the conclusion in a 316(a) hearing should not necessarily govern the outcome of 316(b)" (41 F.R. at 17389). Thus, the RA concluded, even if the 316(a) burden were met, an applicant could face restrictions on intake capacity which could only be met by use of closed-cycle cooling. I believe this conclusion is also correct. As mentioned above, some consideration of cost relative to the environmental

benefits to be obtained through further minimization would be appropriate.

PSCo argues that the interdependent interpretation of 316(a) and (b) is wrong because it makes it impossible for any applicant to obtain a 316(a) ruling; they point out that the RA ruled the 316(a) showing failed because of the potential effects of the intake structures and at the same time said it was premature to set 316(b) conditions because no 316(a) standard had been established. I do not foresee any difficulty in this regard. The 316(a) and (b) decisions can be made concurrently. Indeed, in cases such as this one, the 316(a) and (b) determinations must necessarily be considered together because the discharge functions as an intake during backflushing and vice versa.

(3) Meaning of Term "Capacity" in Section 316(b). The RA stated that under Section 316(b) restrictions could be imposed on intake capacity which could only be met by application of closed-cycle technology. It is important to note in this connection that the 316(b) regulations define "capacity" as "the maximum withdrawal rate of water through the cooling intake structure" (40 CFR §122.11(e)). The Utilities state that the RA "assumed he could impose closed-cycle cooling under §316(b);" they then argue that 316(b) regulates only the intake structures appurtenant to whatever discharge control technology is independently chosen under other sections. They also argue that "capacity" properly refers to the size of the intake structure, not volume of flow or rate of flow.

It is Agency policy that the Agency may not require use of cooling towers under 316(b); however, it may

restrict the capacity of the intake structures and thus indirectly necessitate a closed-cycle system.[FN3] The RA clearly said no more than this.

The Utilities' explanation for the restrictive reading of the term "capacity" is that the size of a structure, in conjunction with the quantity of water needed per unit time by a given cooling system, determines intake velocity. Although intake velocity is one factor affecting entrapment, it is the volume of water withdrawn that principally determines entrainment. There is no justification for giving "capacity" the restrictive meaning ascribed to it by the Utilities, especially since Congress was aware of and concerned about the entrainment effects of intakes (Legis. Hist. at 196-7). The Agency's definition is supported by the literal definition of "capacity" and by the intent of Congress to minimize adverse environmental effects caused by intake structures.

C. Burden of Proof - 316(a)

The burden of proof rules in the Agency's NPDES regulations (40 CFR § 125.36(i)(1)), which the RA applied "procedurally by analogy" in this case, provide that the burden of going forward and the burden of proof are on the party raising the issue at the hearing. The RA held that these rules were only for purposes of the hearing and that the burden of proof in 316(a) cases rests on the applicant throughout the entire permit proceeding.

PSCo argues that an agency is bound by its own rules and that the RA misinterpreted the burden of proof rules. Based on its burden of proof argument, PSCo

complains throughout its brief that the RA "interposed issues not raised by the parties." It also complains, when the RA "finds" that there is inadequate evidence on various points, that these "findings" are not "supported by the record." The Agency argues that "burden of proof" can mean either burden of persuasion or burden of producing evidence; the burden of persuasion remains always with the same party but the burden of producing evidence can shift between the parties. The Agency argues that SAPL had a burden of showing that PSCo's proposed limitations might not assure protection of the marine ecosystem, and that PSCo had the burden of persuading the RA that a "no discharge of heat" limitation was more stringent than necessary.

I find the RA's and the Agency's interpretation of these regulations to be without merit. Clearly the "burden of persuasion" and the "burden of producing evidence" are the same as the "burden of proof" and the "burden of going forward," both of which the NPDES rules place on the person raising the issue.

However, I do agree with SAPL and NRDC that the burden of proof rules in the NPDES regulations are inconsistent with the requirement of Section 316(a) that the applicant must "demonstrate" his entitlement to a 316(a) waiver. Until the Agency has had an opportunity to listen to all points of view its Determinations should not be final and, until they are final, the applicant, under Section 316(a), has the burden of proof. Accordingly, the regulations at 40 CFR §125.36 were inappropriate for 316(a) hearings in this regard, and I am directing the Office of General

Counsel to consider the need for issuance of regulations designed especially for 316(a) hearings.

Though I disagree with the RA's decision regarding the adequacy of the evidence in this case and find that PSCo has in fact carried its burden of proof, I agree with the principle that an RA has the power and the obligation to reverse his Determinations, regardless of the burden of proof rules, when he concludes that his Determinations were incorrect. This would especially be so where he determines that data adequate to support his Determinations are lacking in the record. The Agency is the representative of the public interest and is not "an umpire blandly calling balls and strikes for adversaries appearing before it; the right of the public must receive active and affirmative protection"[FN4] at the hands of the Agency. The courts have made clear that the Agency must take affirmative steps to obtain the information necessary to sound decisions under the statutes it administers, even at the cost of delay; if there is insufficient evidence in the record to sustain the Determinations, there is no choice but to reverse the Determinations until adequate data are adduced. Therefore I commend the RA for the courage and responsibility shown by him in his I.D.

I wish to emphasize that this case points out the importance of close scrutiny by the Regions of an applicant's plans for a 316(a) demonstration and its implementation of those plans; it also highlights the need for a thorough analysis of the applicant's submission before issuance of Determinations. I note in this regard that PSCo's demonstration appears to

consist of a series of reports and affidavits without the "interpretive, comprehensive narrative summary of the demonstration ... [including] a clear discussion stating why the applicant's demonstration is sufficient to assure that the proposed discharge will assure the protection and propagation of a balanced, indigenous community"[FN5] suggested by the Draft 316(a) Manual. Review both at the Regional level and on Appeal would be assisted by such a document. Without passing on the merits of that case, I note that the RA's Determination of March 4, 1977 regarding a proposed unit at the Pilgrim Power Plant appears to provide the type of discussion I have in mind.

D. Burden of Proof - 316(b)

The Utilities argue that the Agency has a duty to implement Section 316(b) and that the RA's decision improperly shifted the burden of proof to the applicant by adopting rules of thumb. For instance, the RA said that an intake structure should be located in waters which are the least productive biologically and should avoid areas such as spawning areas, nursery areas, etc. The Utilities argue that this, coupled with the RA's unduly stringent standard of proof (discussed below), amounts to a per se rule requiring closed-cycle cooling at all estuarine plant locations. They point out that the Agency expressly declined to adopt such a per se rule in the preamble to the 316(b) regulations (41 F.R. 17388).

The RA essentially did no more than repeat the language of the Development Document accompanying the 316(b) regulations, which concluded with respect to consideration of location in 316(b) cases that:

> Plant siting and the location of the intake structure with respect to the environment can be the most important consideration relevant to applying the best technology available for cooling water intake structures. Care in the location of the intake can significantly minimize adverse environmental impacts ... [A]mong the many factors that can be considered in locating the intake structure to minimize adverse environmental impacts [are] ...:
>
> > -Avoidance of important spawning areas, fish migration paths, shellfish beds or any location where field investigations have revealed a particular concentration of aquatic life.
>
> It will be difficult [sic] and perhaps impossible in certain cases to offset the adverse environmental impact of improper intake location by subsequent changes in either design or operation of the intake structure short of significantly reducing the intake volume and/or the development of an effective fish recovery or diversion system. (at 178)

Substantially similar language was contained in the predecessor Development Document dated December 1973, at 144-5. It is clear that the RA did not establish a per se locational rule, but merely considered the intake in the light of the factors described above.

E. Standard of Proof

The RA said the applicant must provide the RA with "the evidentiary showing needed to make a reasoned decision" as to whether the 316(a) test was met and that "adequate information" must be furnished as to the projected stresses on the aquatic environment from all sources. This is clearly correct. However, in the

I.D. the RA occasionally used some phrases which implied a much higher standard of proof. For instance, he said that information on the "the whole marine ecosystem" may be necessary.
PSCo argues that the RA imposes an impossible standard of proof under 316 because he demands a showing with respect to the "whole marine ecosystem" and he seeks absolute assurance and scientific certainty in an area which is complex and uncertain. PSCo argues that the proper rule is "preponderance of the evidence". The Utilities join in this argument. Also, they argue, the RA refused to make an intelligent choice on the basis of reasonably available evidence; the effect is to require cooling towers in every case because the RA is requiring evidence to a degree of precision which is in fact unattainable.

As the Agency points outs, the burden of proof in a 316(a) case is a stringent one. The "preponderance of the evidence" rule would be inappropriate if the evidence being weighed were inadequate. The RA may not speculate as to matters for which evidence is lacking. On the other hand a biologist experienced with thermal discharges, who reviews evidence as to certain species, can often conclude with assurance (based upon his knowledge and experience) that adverse effects will not be suffered by other species or life stages not mentioned.

The question is, at what point is the evidence adequate for a 316(a) determination? No hard and fast rule can be made as to the amount of data that must be furnished. Much depends on the circumstances of the particular discharge and receiving waters. It would be an unusual case where data would be required as to the

effects on the "whole ecosystem".[FN6] Effects on one group of organisms can generally be inferred from the effects on another group of organisms. This is the theory behind the representative important species ("RIS") approach to 316(a) demonstrations (40 CFR §122.9(b)(2)). Data should not be required to be furnished simply because they are collectible, if the data would not aid in the determination to be made. For instance, in this case the RA found that data as to the thermal tolerances of certain life stages of RIS were missing. Though this is true, I find that, examining the data in the record in the light of an informed scientific judgment, it is not necessary for PSCo to furnish further data; the available data are sufficient for me to conclude that there will not be an imbalancing of indigenous populations. However, in another case, the applicant might have to furnish not only complete data as to the RIS, but possibly additional data.[FN7] The greater the risk, the greater the degree of certainty that should be required. The rule is stated reasonably well in the Draft 316(a) Manual:

> Mathematical certainty regarding a dynamic biological situation is impossible to achieve, particularly where desirable information is not obtainable. Accordingly, the Regional Administrator (or Director) must make decisions on the basis of the best information reasonably attainable. At the same time, if he finds that the deficiencies in information are so critical as to preclude reasonable assurance, then alternative effluent limitations should be denied. (p. 8)

In this connection I note that the RA apparently felt

constrained to avoid discussion of the merits of the case with his technical staff after the hearing because they were "parties" to the case and could not be consulted in the absence of the other parties. Consequently the RA was deprived of the opportunity to consult with experts experienced in the matter of thermal discharges, and reviewed the record with only the assistance of his legal staff and a biologist hired for the purpose. This unfortunate result appears to have occurred partly because the Agency took a position in favor of its Determinations (i.e., in support of PSCo) at the hearings, thus becoming "party" as well as judge. This seems to to me to have been unnecessary and of dubious propriety.

I am requesting my staff to review this aspect of the case with a view toward assuring that in future 316 cases RAs will have available to them adequate Agency resources to assist in the review of the record. In connection with the review of the regulations mentioned above, I am asking the Office of General Counsel to review the question of whether the Agency should act as a "party" in 316(a) proceedings.

F. Receiving Waters

One of the underlying questions to be considered in making the decision in this case was what should be considered as the receiving waters. The Hampton-Seabrook area is part of the Gulf of Maine, a much larger body of water, which in turn is part of the Atlantic Ocean. Obviously an impact which created an imbalance in the local indigenous populations might not be felt in the Gulf of Maine or the Atlantic Ocean. Put another way, if the Atlantic Ocean (or a portion of it as large as the Gulf of Maine) is to be considered as the

receiving water, then Section 316 might be a dead letter as to coastal power plants because plants of a size likely to be built probably would not have an effect on such an enormous body of water. Therefore I think that in order to give effect to Section 316 it is necessary to look at a smaller portion of the coastal waters where human use or enjoyment of the marine resource may be affected. The portion chosen is necessarily arbitrary to some extent where, as in this case, there are no obvious physical boundaries.

For this case I have determined that the appropriate area to look at in considering the effects of Seabrook's discharge is the localized area within and proximal to Hampton Harbor, which includes the estuary area with its biologically rich fauna. However, while doing this I have taken into account the fact that this localized area is part of, and is fed by, the larger area of the Gulf of Maine and the Atlantic Ocean. For instance, local populations of certain species of fish are supplemented by recruitment from the Gulf of Maine. Thus the impact of the Seabrook discharge on this localized area is less than it would be if the localized area were a closed body of water of the same size.

III. The Thermal Discharge (316(a))

A. Effect under Normal Conditions

The RA found, on his review of the record, that there was inadequate evidence as to the direct and indirect effects of the thermal discharge on indigenous populations, in various particulars.

In reviewing the adequacy of the record I have utilized the expert judgment of the technical and scientific

panel mentioned above. The biological experts on the panel reviewed the record with the benefit of their general knowledge and judgment. The technical and scientific panel panel also have experience with thermal discharges and were able to bring their experience to bear in determining the probable effect of the Seabrook operation on RIS and indigenous populations.

Unlike many other plants, Seabrook will use a multiport, high-velocity diffuser which is designed to minimize the exposure of marine organisms to high temperature regions. This design means that there will be only a small area or volume of water in which significant lethal or sublethal effects would be expected on any organisms. (This is quantified in PSCo's brief, which states that under full load conditions, the 10°F isotherm will encompass a maximum volume of 0.33 acre/feet and the 5°F isotherm will encompass a maximum volume of 3.03 acre/feet).[FN8] Thus the Seabrook discharge will affect only a small portion of the Gulf of Maine within or proximal to Hampton Harbor.

Moreover, I believe, on the recommendation of the panel, that the intake should be located at the far site, which will further minimize any potential environmental effects. The data are inadequate for a 316(a) demonstration at the near site because worst case conditions were not assumed in modeling the thermal impact of backflushing from the near site on the Sunk Rocks. In any event, the far site is much preferable to the near site because: 1) there will be less likelihood of thermal impact on the Sunk Rocks

resulting from backflushing at the far site; 2) the near site is located close to the presumed migratory pathways in and out of the estuary; 3) entrainment of meroplankton of coastal species will be less at the far site (this is expected to compensate for the possibility of an increased entrainment of pelagic plankton); and 4) the outcroppings at the Sunk Rocks area will attract fish to this site and will increase entrapment there.

The panel concluded that the net effect is that significant environmental impacts cannot be anticipated in the area affected by the discharge, and that the data available in the record indicate that the "balanced indigenous population" of shellfish, fish and wildlife in the Gulf of Maine within or proximal to Hampton Harbor will not be significantly affected. They therefore concluded that it was not necessary to have thermal effects data on all life stages of all RIS, as the RA had required.[FN9] I agree with these conclusions.

Regarding data as to the size and stability of populations, the panel concluded that determinations of the species distribution, abundance and relationships among components of the ecosystem might exceed the state-of-the-art, especially for certain types of organisms. The relationships between and among the species comprising a given assemblage (i.e., "population" as used in Section 316(a)), such as the benthic community or the phytoplankton community, are extremely difficult to define and elaborate. This difficulty increases as a function of the number of components to be considered. As mentioned before, it is much easier to understand or model a community of

five species which may interact with each other than one of 20 species. The potential for interaction increases as a factorial of the number of species. Also, generally the species for which studies are available are those of economic or ecological importance, either because of numerical dominance or wide distribution. Consequently, many species have not been studied to a level that permits defining their role in the ecosystem. Accordingly I do not find it necessary to have the degree of information as to size and stability required by the RA in order to make a judgment as to the impact of Seabrook.

The RA also found that there was no useful information in the record concerning the volume of water which would be entrained in the thermal plume and thus no way of estimating the numbers of planktonic organisms, for example, that would be exposed to the heated water. Actually, using data in the record, the numbers of plankton entrained can be approximated. However, even without estimates of numbers of plankton entrained it can be concluded that the overall impact of such entrainment on the population of all plankton in the Gulf of Maine within and proximal to Hampton Harbor will not be significant. This is because the portion of the plume which contains water of sufficient temperature to shock or kill plankton is small relative to the available water mass; many plankton will be quickly replaced because of their rapid regeneration times; and recruitment from other areas will replenish stocks.

The RA was concerned that much of the data on thermal tolerances in the record was based on studies in which organisms had been acclimated to

temperatures other than those that will occur at Seabrook and that they were of questionable relevance to an effort to estimate the impact of exposure to a quick temperature increase such as will be experienced by organisms entering the Seabrook discharge. He was also concerned that some studies noted lethal temperature limits below those of the Seabrook discharge even though these studies generally involved gradual temperature increases. The RA felt that, together, the lack of thermal data and the lack of information about numbers of organisms exposed made it impossible to determine the overall direct impact of the plant. On the recommendation of the panel, however, I find that, given the small area to be impacted with a delta-T greater than 5°F, it is reasonable to conclude that local indigenous populations will not be significantly affected.

B. Effect Under Backflushing Conditions

The RA found that the record did not contain an adequate discussion of the thermal effects of the intake operating as a discharge during backflushing or of the entrapment potential of the diffuser acting as an intake. Upon review of the record I found it inadequate as to the effect of backflushing. Specifically, I found that there was no information in the record on the vertical structure of the backflushing plume, and therefore the three-dimensional plume structure could not be developed from the information in the record. Hence, estimates of exposures of plankton and other organisms to the various temperature regions of the backflushing plume could not be established. I therefore issued a Request for Information, requesting PSCo to supplement the record with respect to these matters and offering the

parties an opportunity to submit comments and requests for a hearing. Affidavits were submitted by PSCo, NHAG, EPA and SAPL. SAPL submitted a request for a hearing, which is dealt with below.

During backflushing, heated effluent discharged from the intake at the far site could, under occasional meteorological and hydrological conditions, cause a 3°-4°F rise for about 3-6 hours twice a month around the Outer Sunk Rocks (less often during the winter). Such a small increase for such short time periods should result in no biologically significant lethal or sublethal effects on the communities in the area of the Sunk Rocks. The discharge will not affect benthos in the vicinity of the backflush because of the buoyant nature of the plume. Nekton should for the most part be able to avoid lethal temperature elevations in the discharge plume, though some fish may be killed upon start-up of the backflushing operations. There is no reason to believe, however, that such fish kills, if they occur, will be in numbers sufficiently large to cause an imbalance in the indigenous population, even taking into account the other stresses upon the affected species.

Plankton could suffer lethal or sublethal effects as a result of entrainment in the higher temperature regions of the backflushing plume. However, the volumes of water which will be heated sufficiently to cause these effects are small. Moreover, the number of plankton killed by passage through the plant will be considerably lower during backflushing than during normal operations, due to the decreased flow. A review of the record convinces me that the impact of backflushing on plankton will be insignificant.

Regarding Mya larvae, in response to the Request for Information, PSCo submitted a calculation indicating that 70 bushels of Mya would be destroyed indirectly due to the effects of entrainment of larvae in the backflushing plume during the month of maximum impact. PSCo made the assumption that this loss would be distributed evenly over the 2500 acres of clam flats between southern Maine and northern Massachusetts and calculated that only 0.12% of the Mya harvest in the Hampton-Seabrook area during 1975-6 would be destroyed. Also, in Draft Technical Report VII-3, PSCo's consultant made similar calculations with respect to normal operations and concluded that normal operations would result in destruction of only 0.4% of the Hampton-Seabrook 1975-6 harvest. These calculations are open to doubt because the survival ratios used would not allow the maintenance of a Mya population at equilibrium in the Hampton-Seabrook estuary.

Destruction of Mya larvae could result from entrainment through the plant during normal and backflushing operations and entrainment in the thermal plume during normal and backflushing operations. Draft Technical Report VII-3 made a reasonable estimate of Mya mortality due to through-plant entrainment as 83×10^9 larvae. As indicated above, larval mortality due to plume entrainment during normal operations would be insignificant. It is reasonable to assume that backflushing will occur three times each summer when there are larval Mya densities of any significance, and that larval Mya densities at those times will be $2500/m^3$. Assuming that the average backflushing flow is one-half that of

the normal flow rate, it can be calculated that about 5 x 10^9 Mya larvae would suffer mortality due to through-plant entrainment during the three backflushing operations.

Regarding entrainment in the backflush plume, in the absence of experimental data to the contrary it is reasonable and probably conservative to assume, as Bosworth did in his supplemental Affidavit, that Mya larvae entrained in the backflush plume will be killed if subjected to a temperature greater than 79°>>>>>>> F. From the equations provided in the supplemental Affidavit of MacPherson it can be calculated that at a delta-T of 56°F approximately 12 x 10^9 Mya larvae will be killed by entrainment in the backflush plume during the three backflushing operations.

Thus the mortality of Mya larvae from all sources related to the Seabrook operations would be approximately 1 x 10^{11}. The total seasonal production of Mya larvae in the neritic band in the vicinity of the Seabrook cooling system is reasonably estimated in Draft Technical Report VII-3 as 2 x 10^{12} larvae. Thus the larvae killed would be about 5% of the larvae in the neritic band in the vicinity of Seabrook. If it is assumed that destruction of Mya larvae would result in destruction of the same proportion of adult clams, the Seabrook operations would be expected to destroy approximately 5% of the standing crop of Mya in the Hampton-Seabrook area. (This figure is of the order of magnitutde of the figure arrived at by use of an entrainment model discussed elsewhere in this decision.) This 5% figure represents a considerable over-estimate because larvae settle in densities much

greater than the final density of adult populations. Considering that a single adult clam, which may have a life span of 3-4 years, releases several million eggs per spawning and my spawn several times each year, a loss of this order is not expected to have a significant impact on local populations.

I note that there appears to be serious over-cropping of Mya larvae in the Hampton-Seabrook area, which could doubtless be controlled through appropriate licensing laws. The effects of the Seabrook plant will not have any significant impact on the number of clams recruited to the Hampton-Seabrook flats or other estuaries. The over-cropping of clams in Hampton-Seabrook could have an effect on recruitment of clams to other areas, but probably does not have much impact on recruitment to Hampton-Seabrook itself. The evidence indicates that tidal flushing is rapid, with complete flushing in one one or two tidal cycles, so that reproductive products from the Hampton-Seabrook flats will be washed out of the estuary. However, it must be stressed that if there is any threat to successful recruitment of clams to other areas, the threat would be posed by the overcropping and not by the plant.

In connection with backflushing, I note that the effect of backflushing, particularly the effect on the Sunk Rocks area, can to some extent be mitigated by avoiding backflushing during adverse meteorological and hydrological conditions. While the Determinations do not expressly require backflushing to be avoided at times of adverse meteorological conditions, I note that Condition I(C)(6) provides that NPDES permits issued from time to time in regard to the discharge will

contain such further limitations or be modified to contain such further limitations on the thermal component of the discharge as the results of available information indicate to be necessary to assure the protection and propagation of a balanced indigenous population. I hereby direct the RA to give due consideration to the development of further conditions pursuant to this clause. Specifically, I understand and interpret Condition I(C)(6) as meaning that the NPDES permit as issued for the plant will contain appropriate limitations in regard to the avoidance of backflushing at times of adverse meteorological and hydrological conditions.

C. Cold Shock

The RA "granted" a finding requested by SAPL that unexpected shutdowns of the diffuser would cause measurable impacts on the balanced indigenous population ("cold shock"), "in view of [his] findings concerning lack of information on the thermal effects of the diffuser on plankton, and for similar reasons...." It is not clear whether the RA meant to find that cold shock would in fact occur or whether he meant simply that he had inadequate evidence to decide the question, but in either event I disagree. Cold shock requires that an organism maintain itself in the warm environment long enough to become acclimated and then be quickly exposed to cold water. As PSCo points out, plankton could not resist the current that flows away from the diffuser; once in the plume, they would experience only gradual temperature decreases. The high velocity of the discharge should prevent fish from inhabiting, and therefore becoming acclimated to, the plume areas of highest temperature, a prerequisite for cold shock. Because of this velocity, fish are unlikely to become

acclimated to a temperature greater than 5° above that to which they would be exposed during shutdown. Generally, a decrease of 15° to 25°>>>>>>> F is necessary for fish to be killed by cold shock. Benthic organisms would not be exposed to a rapid temperature decrease because the thermal plume rarely impinges on the bottom and will result in temperature increases on the benthic community of, at most, 1°F or 2°>>>>> F for short periods of time. Therefore these organisms would not become physiologically acclimated to the plume. The statements made by witness Leger in Exhibit 37 reflect what is generally accepted by fish biologists involved in thermal effects research. He concluded that cold shock would be minimized at Seabrook.

Past instances of cold shock at thermal power plants have occurred predominantly within surface discharge canals. For example, Leger mentioned menhaden kills in the discharge canal of the Oyster Creek plant in New Jersey. Even surface discharges do not always experience cold shock problems. Leger was able to find no record of cold shock at any New England power plant, including those with surface discharges at Brayton Point, Cape Cod Canal, and Pilgrim Nuclear. Submerged discharges such as that proposed for Seabrook are much less likely to cause cold shock fish kills. I conclude on the basis of design and past history in New England that cold shock will be an infrequent and insignificant problem at Seabrook, and that unexpected shutdown of the diffuser will not cause measurable impacts on the balanced indigenous populations.

D. Impact on Wildlife

The RA concluded that there was no evidence on the question of whether there will be any impact on wildlife, such as birds. This is not completely accurate because there are data on the effect of the plant on the biota on which birds feed. I have concluded elsewhere in this decision that the effect of plant operations on these biota will not be significant. On the basis of this record, I find there is no anticipated effect on wildlife, including birds, from this subsurface thermal discharge. That being the case, I do not believe that PSCo should be required to adduce further evidence in this regard.

E. "No Measurable Rise"

The RA decided that he had correctly limited the thermal discharge from backflushing and normal discharge to "no measurable rise" at the Inner and Outer Sunk Rocks, since (a) backflushing water might be mixed with water at the "highest naturally occurring temperature" and create "water above the natural high;" (b) operational adjustments can be made to manage the thermal impact; and (c) the information on thermal impacts was inadequate. PSCo urged adoption of a limitation of "no measurable rise above naturally occurring temperature fluctuations of the receiving water in and around the area of the Inner and Outer Sunk Rocks."

On review of the evidence in the record as to the effect of temperatures on the Sunk Rocks biota, I find that the RA's criterion of "no measurable rise" was too stringent. Taken literally, this standard means that a rise of as small as 1/10 of a degree (which would be a "measurable rise") could not be tolerated at the Sunk

Rocks. Model studies predict slight temperature rises at the Sunk Rocks during backflushing. Such rises would not have an impact on indigenous populations sufficient to cause an imbalance.

On the other hand, the standard suggested by PSCo (that the temperature should not exceed naturally occurring ambient temperature fluctuations of the receiving waters in and around the area of the Inner and Outer Sunk Rocks) is ambiguous. It is not clear where the "ambient" temperature fluctuations would be measured (vertically or horizontally) and during what time periods they would be measured.

Both standards seem to be unsuitable for enforcement purposes, since it is not apparent how compliance with either standard could be measured. For instance, if thermistors were placed at the Sunk Rocks there would be no way of telling whether any rise in temperature registered by them was due to natural causes or to the impact of backflushing. The RA should delete the "no measurable rise" criterion and should replace it, if desirable, with some other enforceable criterion appropriate for the protection of the Sunk Rocks biota.

F. Baseline Data

The RA found that there was inadequate baseline data and that this would hamper later efforts to study the changes wrought by the plant for the purpose of taking corrective action. I agree. I hereby direct the RA to review the report of the technical and scientific panel in this regard with PSCo and to require PSCo to develop a plan to provide adequate baseline data which will be acceptable to the RA.

G. Conclusion

On the basis of the data in the record, as supplemented pursuant to the Request for Information, and on the recommendation of the panel whose advice I have sought, I conclude that the discharge limitations proposed for the far site will assure the protection and propagation of a balanced, indigenous population of fish, shellfish and wildlife in and on the receiving waters. In coming to this conclusion I have considered the effects of the entire cooling system, including entrapment, entrainment, and discharge.

IV. The Intake (316(b))

A. Design

After reviewing the evidence in the record on velocity, the RA found insufficient evidence to conclude that the 1 fps velocity proposed for the intake was the best to minimize entrapment, and suggested that diversion or other means of avoiding fish entrapment may be necessary. Velocity is only one of several factors influencing entrapment by intakes. While fish entrapment is reduced as velocity at the intake face is decreased, the design of the structure is also critical. Modifying the conventional velocity cap by extending the upper and lower lips (to obtain a "T" structure) reduces entrapment. Also placement in the water column influences entrapment. Finally, the most important factor is the location of the intake in relation to the location of potentially entrapable organisms. I find that all of these criteria, including intake velocity, have been taken into account in designing the intake structures.

In an ultimate sense it is impossible to optimize velocity, since the optimum velocity for one species at one life stage may not be the optimum velocity for that species at another life stage, or for some other species. At different times of the year different species can be expected to be susceptible to entrapment by the intake. Consequently, designing for a single velocity cannot protect all fish at all times. Moreover, as the RA points out in his I.D., the entire range of values between 0.5 fps and 1.0 fps will be found within a very short distance from the intake. To attempt to further refine the velocity in this case is unnecessary and not likely to result in any measurable reduction of entrapment loss (which will be negligible in any event).

Moreover, because entrapment will be negligible (as discussed elsewhere herein) I do not believe that the intake structures need be further refined to provide diversion or other means of avoiding entrapment. I note, however, that should this prove to be incorrect, the Determinations require, in Condition II(H), that NPDES permits issued from time to time in regard to the cooling water intake structures must contain such further limitations and requirements as available information indicates to be necessary to minimize adverse environmental impact.

B. (1) Location - Entrapment

The RA found that even if the effects of the intake alone (entrainment and entrapment) were considered, the impact on many species was unknown and could be significant. Specifically, the RA found that there was inadequate information on actual migratory pathways in and out of Hampton Harbor, and little evidence of the actual overall abundance of the finfish species in

the area potentially impacted, at either the near site or the far site.

It is true that only limited data exist on the migratory pathways of fish to and from Hampton Harbor. However, fish migration is commonly diffuse and not associated with a precise narrow path unless there is some continuous physiographic characteristic for orientation, such as the contour of a significant change in depth. Both the Sunk Rocks and the intake areas are point locations rather than continuous physiographic characteristics, and migrating fish would not be expected to consistently move through these areas. Rather, they would more likely occur there only through random migratory movements. Consequently neither substantial entrapment nor disruption of migratory movements can be expected. It is highly unlikely that studies of fish migration, which would be very expensive and time-consuming, would yield any useful information with respect to the best location for the intake structures. I cannot therefore conclude that they are required in this case.

Moreover, I believe that the evidence in the record indicates that entrapment is likely to be negligible. That being the case, I cannot conclude that studies of the actual abundance of finfish in the area are necessary.

B. (2) Location - Entrainment of Mya

PSCo studied the extent to which Mya larvae would be entrained by the intake by means of a model. Under PSCo's model the flow of water into the intake is determined and compared with the flow of water in a hypothethical area in the near-shore waters. The flow

into the intake is assumed to be a box with a fixed length of 1000' and widths and depths which vary with ambient current speed and density stratification. This "entrainment box" represents the bounding streamlines leading to the intake; all of the larvae in this box are "entrained" per unit time. The number of larvae in the entrainment box is calculated and compared with the number of larvae in a hypothetical volume (used as the assumed habitat of the Mya larvae) which is 2 1/2 miles wide and 30 feet deep; the length of this volume is determined by the ambient velocity being considered.

The RA found that the assumption in the model of uniform distribution of Mya larvae is unreliable in view of the known patchiness of larvae. He also found that current speed determines the width of the streamlines of the intake flow in the model and could even lead to repeated exposures to plant-induced stresses; thus, due to greatly varying current levels and patchiness of larvae, actual larval mortality might greatly exceed the predicted 4.6%. The RA found on the one hand that this impact could be potentially severe and on the other hand that it was impossible to estimate what the impact of a 4.6% mortality would be on adult populations.

Mya larvae are acknowledged to be patchily distributed; however, if the larvae are looked at over a large enough time and space scale, the effect would tend to be the same as uniform distribution. Over the time and space scales used in PSCo's model (which were reasonable for Mya), it is valid to assume that patchiness would tend to become integrated. That being the case, there would be no point in trying to

model patchiness because such an effort would not yield significantly different results from the calculations already furnished by PSCo.
The model is based on assumptions which are highly conservative, for various reasons, and thus yields results which are likely to exceed actual mortalities. Mya in fact occupy a volume which is longer than the hypothetical Mya habitat used in the model; in other words, they occur to the north and the south of the 2 1/2 mile-wide box. Thus, if for instance the model says that 4.6% of larvae are entrained, in fact this is 4.6% of only a portion of available Mya larvae.

When the model is run with very slow currents, the percent of larvae entrained rises until 100% entrainment is approached. However, it is unrealistic to assume that, in the hydrodynamic situation present at the intake site, there will be a long period of slow currents. Consequently the fear expressed by SAPL, namely that under slow current conditions a large percentage of Mya would be entrained, is unrealistic; it ignores the tide, wind and density current conditions in the Gulf of Maine. The problem is analogous to that of patchiness. Considering only tidal currents, if a short time period is examined, a slow current and high percentage of larvae entrained are possibilities, but over a longer time period slow currents will alternate with fast currents; these flows will tend to average out to a typical flow. The conditions assumed by PSCo regarding typical flows are reasonable.

Also, the model breaks down at low current speeds because it indicates that water would be entrained from all directions in the Gulf of Maine—in other words, that the intake would function as a drain in the

bottom of a basin. This would not in fact happen, and thus the high larval entrainment which the model predicts under such circumstances will not occur.

While the model is a simple one of limited utility, it is sufficient, because of the conservative nature of its predictions. For instance, PSCo found that under different density stratifications and plankton distributions 2.9% to 4.6f Mya would be entrained. The 4.6% figure is in itself conservative because it represents conditions in which Mya are oriented toward the bottom of the entrainment box under extreme summer stratification conditions. It is unrealistic to suppose that such conditions would continue for long periods of time, or that Mya would be so oriented during the entire period of their journey past the intake. Also the calculations were made for the inshore site which has intake openings approximately 24-31 feet below the surface (30 feet in the model); at the offshore site the intake openings are 41-48 feet below the surface. It is difficult to envisage entrainment over this entire depth. Thus for various reasons the estimated 4.6% mortality can be expected to be on the high side.

A more sophisticated model could be developed which would take into account tides, wind and the thermohaline circulation, but it is doubtful if the estimate or its predictive value would be significantly improved. A 4.6% reduction in larvae cannot be expected to result in a 4.6% reduction of the adult population because it does not take into account compensatory mechanisms and density-dependent limiting factors. Taking into account both the highly conservative nature of PSCo's model and the post-

larval mortality of Mya, I conclude that entrainment of Mya will have an insignificant effect on adult Mya populations.

B. (3) Location - Entrainment of Icthyoplankton

The RA found that it is impossible to conclude whether the near or far site would represent an advantage with respect to entrainment of ichthyoplankton, and that the overall effect of such entrainment on adult populations is unknown.

The far site would offer an advantage with respect to icthyoplankton since it lies in deeper water. The majority of eggs of many species are found near the surface of the ocean and hence would escape entrainment. Moreover, the far intake site is believed not to be located in the immediate vicinity of unique spawning beds for any species. That being the case, post-larval recruitment of fishes from other areas would reasonably be expected to offset any effects of entrainment.

C. Diffuser Functioning as Intake During Backflushing

The RA found the record inadequate with regard to discussion of the effects of the entrapment potential of the diffuser acting as an intake. Upon review of the record I have concluded that it is not inadequate and that the use of the diffuser as an intake during backflushing is not likely to cause entrapment in any degree more significant than the intake. This is because of four factors:

1. Entrapment problems can result because fish seek shelter near a structure. However, the diffuser risers

are small and provide less shelter than the intake structure.

2. During a considerable portion of the backflushing cycle (2 1/2 hours out of a six-hour cycle), the volume of flow is only 38% of the normal flow.

3. The backflush cycle occurs only about 1.8% of the time during the summer and less in winter.

4. The diffuser pipes are not too far from horizontal (20°-25°>>>>>>>>) and thus, even without velocity caps, the intake will be nearly horizontal.

I note that PSCo is required by Condition II(C) to use an antifouling protective coating on the cooling water intake structure, to discourage growth of organisms which might attract browsing fish which would then be susceptible to entrapment. I direct the RA to consider whether a similar condition should be required with respect to the diffusers to reduce possible entrapment losses.

D. Conclusion

I find that the design and location of the intake at the far site and of the diffuser functioning as an intake reflect the best available technology for minimizing adverse environmental impact. In coming to this conclusion I have taken into consideration the effects of the discharge as well.

IV. Other Issues

A. Applicability of Section 403

NWF argues that the RA's determination to

disapprove the Seabrook discharge is independently sustainable under Section 403 of FWPCA. Section 403 prohibits issuance of a permit under Section 402, after promulgation of guidelines estabished under Section 403(c), except in compliance with such guidelines. Prior to the promulgation of such guidelines, a permit may be issued under Section 402 if the Administrator determines it to be in the public interest. Section 403(c) requires promulgation of guidelines for determining the degradation of the waters of the territorial seas, the contiguous zone, and the ocean, which shall include, among other things, the effect of disposal of pollutants on plankton, fish, shellfish and wildlife; the effect of disposal of pollutants on marine life, including changes in marine ecosystem diversity, productivity, and stability and species and community population changes; other possible locations and methods of disposal or recycling of pollutants; and the effect on alternate uses of the oceans, such as scientific study. There are no currently applicable 403 guidelines, the ones promulgated in 1973 having been revoked (38 F.R. 28613).

PSCo and the Utilities argue that Section 403 does not apply to discharges of heat. This argument runs counter to the express language of FWPCA. Section 403 applies to permits for "discharges"; this is a term of art in the statute which means "a discharge of a pollutant" (§502(6)), and "pollutant" is expressly defined to include heat (§502(6)). The disposal of heat may have an effect on plankton, fish, shellfish and wildlife, and may result in changes in marine ecosystem diversity, productivity and stability and species and community population changes. In cases where 316(a) waivers are obtained, Section 403 largely duplicates

§316(a); however, in cases where a 316(a) waiver has not been obtained, but 301 or 306 standards apply, Section 403 would not be duplicative.

I believe that, for me to disregard the plain meaning of the statute, there should be clear legislative history indicating a contrary meaning, and that is not the case here. The Conference Report stated that Section 403 regulates "the discharge of pollutants subject to this Act" (which term, as discussed above, includes discharges of heat) from any "outfall sewer" (Legis. Hist. at 177). PSCo urges that the term "outfall sewer" does not include a thermal discharge such as Seabrook's. Though the Conference Committee may have had in mind that Section 403 would regulate principally discharges of industrial and sanitary waste, casual use of the term "outfall sewer" is insufficient to indicate an intent to exclude pollutants other than chemical and sanitary wastes.

The Senate Committees on Commerce and Public Works had competing jurisdictional claims in the areas covered by Section 403 of the Senate version of FWPCA and H.R. 9727, an ocean dumping bill. Senator Magnuson stated that Section 403, coupled with Section 502(n) (which defined "discharges" basically in the same manner discussed above), accurately reflects the agreement of these Committees as to the two bills—that is, the Committee agreed that "the regulation of discharges of pollutants" within the territorial and internal waters of the United States will be governed by the provisions of the Senate version of FWPCA and in areas beyond that "the regulation of transportation for dumping of materials originating in the United States" will be governed by H.R. 9727.

(Legis. Hist. at 1380). The Senator carefully distinguished between regulation of "dicharges" and regulation of "dumping." Senator Hollings concurred that "the discharge of pollutants from outfalls, vessels or any other source" within the internal or territorial waters of the United States would be governed by the proposed FWPCA amendments and that "the regulation of such discharges will be through a permit program, applying discharge criteria provided in Section 403 of the act." (Legis. Hist. at 1381; emphasis added).

PSCo also argues that because of the "clear complementary relationship" between Section 403 and the ocean dumping statutes it can be inferred that disposition of the same sorts of materials were to be prohibited; since the ocean dumping statute does not prohibit dumping of heat, PSCo argues, therefore Section 403 must not. Leaving aside the question of whether such a mode of statutory interpretation is valid, the short answer is that one would not expect an ocean dumping statute to cover heat because heat is discharged through pipes and is not transported on a vessel for ocean disposal. In conclusion, I believe that Section 403 applies to discharges of heat.

Upon review of the record in this case and of appropriate portions of the Final Environmental Impact Statement issued by the AEC in December, 1974, I have determined that PSCo's requested thermal discharge would be "in the public interest" within the meaning of Section 403(a).

B. Motion of PSCo Regarding EPA Brief

On February 14, 1977 PSCo filed a Motion for

Enforcement of Administrator's Order or, For Alternate Relief, requesting that the brief of the Environmental Protection Agency be stricken and that the Proposed Findings and Conclusions of EPA Enforcement Division - Region I and EPA, Office of Water Enforcement, be substituted therefore.

The Proposed Findings are in the record and the record indicates the position taken by the Enforcement Division on behalf of the Agency at the adjudicatory hearing. Properly speaking, it is the Agency, not the Enforcement Division, which took part in the proceedings below. On Appeal, the Agency determined that its brief was to be filed by its Office of General Counsel. It is for the Agency to determine by whom it will be represented. The motion is denied.

C. Filing of Reply Briefs and Brief of Governor of New Hampshire

On February 11, 1977 the Utilities filed a request to file a reply brief, accompanied by that brief. SAPL objects to the filing of the brief and to the manner in which the request was made. It has been past practice of the Judicial Officer to permit the filing of reply briefs as a discretionary matter, though the filing of reply briefs is not specifically authorized in the regulations. The filing of the request concurrent with the brief was specifically authorized by the Judicial Officer in this case. Because of the complexities of this case, I felt it was useful to permit the filing of reply briefs, and accordingly the requests of the Utilities and PSCo in this regard are hereby granted. The brief by the Governor of New Hampshire was timely filed in accordance with the notice granting him permission to file an amicus brief.

D. Denial of Request for Hearing

On March 23, 1977 I issued a Request for Information from PSCo and gave the other parties an opportunity to furnish comments on PSCo's submission within 10 days from the date of submission, in affidavit form. I also stated that a hearing with respect to PSCo's submission might be held upon the request of any party upon a showing, among other things, that there was a genuine and substantial issue of fact for resolution at a hearing and that such factual issue was capable of being resolved by available and specifically identified reliable evidence; I stated that a hearing would not be granted on the basis of mere allegations or denials or general descriptions of positions and contentions.

As mentioned above, materials were received in response to the Request for Information from NHAG, PSCo, EPA and SAPL. SAPL requested a hearing. Upon review of SAPL's request I find that it does not meet the criteria specified in the Request for Information. SAPL has not identified genuine substantial issues of fact for resolution at a hearing by specifically identified reliable evidence. It has merely made general allegations about issues which appear to be adequately dealt with on the record to date. For instance, the accuracy of larval identification was the subject of exhaustive testimony in the hearing below, and SAPL does not indicate that it has new evidence on this point. SAPL does not identify any substantial issue which it has not dealt with, or had the opportunity to deal with, in the case below or in its written submission. I am not persuaded by SAPL's request that a hearing would be of assistance to me in resolving the underlying issues in this case. In view of

the need for an expeditious resolution of this case and the failure of SAPL to state a basis for holding further hearings in accordance with the criteria set forth in my Request for Information, I am hereby denying SAPL's request for a hearing.

Accordingly, as indicated above, the Initial Decision of the Regional Administrator is reversed. The Determinations are reinstated, except that Condition I(C)(2) requiring "no measurable rise" at the Inner or Outer Sunk Rocks shall be promptly modified by the RA in accordance with this decision. I direct the RA to consider also modification of the Determinations to impose additional conditions as mentioned in this Decision.

Douglas M. Costle
Administrator

FN1. It was determined by the RA that Seabrook Station is not a new source and this determination was not Appealed.

FN2. A Legislative History of the Water Pollution Control Act Amendments of 1972, ("Legis. Hist.") 93rd Cong., 1st Session, p. 264.

FN3. Decision of the General Counsel on Matters of Law No. 41, Issue No. III, June 1, 1976.

FN4. Scenic Hudson Preservation Conference v. FPC, 354 F.2d 608, 620 (2d Cir. 1965), cert. denied, 384 U.S. 941 (1966) (Scenic Hudson I).

FN5. Draft 316(a) Technical Guidance—Thermal Discharges, September 30, 1974 p. 7.

FN6. The difficulty of precisely modeling the "whole ecosystem" increases exponentially with the number of species in the system. Thus, while it is possible to model a system of, say, five species which interact with each other, this task becomes extremely difficult with most natural systems. The reason is that most systems are comprised of hundreds or thousands of species; the possible interactions are astronomical.

FN7. The regulations make it clear that the granting of a 316(a) request after a RIS demonstration is permissive and not mandatory (40 CFR §122.9(a) (2) and (b) (i)). Morever, 40 CFR §122.9 (b)(2)(iii)(A) provides that "in determining whether or not the protection and propagation of the representative, important species will be assured the Regional Administrator may consider ... any additional information submitted by the owner or operator or required by the Regional Administrator." (Emphasis added.) Thus, in appropriate cases the Regional Administrator may request information beyond that furnished in the normal RIS demonstration.

FN8. The legislative history indicates that mixing zones are to be considered under 316(a). Legis. Hist. at 264, 167.

FN9. I wish to make clear that the amount of data sufficient for 316(a) demonstration in one case may not be sufficient in another case. The degree to which data are required on all life stages of RIS depends to some degree on the situation being examined. The less the

magnitude of the risk, the less certain the evidence should have to be in order to allow the risk and vice versa. For example, if either the proposed discharge or intake sites were within an enclosed area (such as Hampton Harbor), comprehensive and complete thermal effects data on appropriate RIS would be necessary.

1 E.A.D. 332, 1977 WL 22370 (E.P.A.)
END OF DOCUMENT

Docket OW-2002-0049 DCN# 6-4075
Science Applications International Corporation (SAIC)
Preliminary Regulatory Development, Section 316(b) of the Clean Water Act, Background Paper Number 1: Legislative, Regulatory, and Legal History of Section 316(b)

PRELIMINARY REGULATORY DEVELOPMENT SECTION 316(b) OF THE CLEAN WATER ACT

BACKGROUND PAPER NUMBER 1: LEGISLATIVE, REGULATORY, AND LEGAL HISTORY OF SECTION 316(b) AND INFORMATION ON FEDERAL AND STATE IMPLEMENTATION OF COOLING WATER INTAKE STRUCTURE TECHNOLOGY REQUIREMENTS

APRIL 4, 1994

Prepared for:

U.S. Environmental Protection Agency
Office of Wastewater Enforcement and Compliance
Permits Division
401 M Street S.W.
Washington, D.C. 20460

Prepared by:

Science Applications International Corporation
7600-A Leesburg Pike
Falls Church, VA 22043

EPA Contract No.: 68-C8-0066; WA# C-5-55(P)
SAIC Project No.: 01-0833-03-6957-001

1. INTRODUCTION

The office of Wastewater Enforcement and Compliance (OWEC) of the U.S. Environmental Protection Agency (EPA) recently tasked Science Applications International Corporation (SAIC) with developing a summary of the legislative, regulatory and legal history surrounding the development, implementation, and enforcement of requirements under §316(b) of the Clean Water Act (CWA).[1] The purpose of this paper is to provide EPA with pertinent background information as the Agency begins consideration of future regulatory activity under CWA §316(b) This paper presents an initial synthesis of the legislative, regulatory and legal history of CWA §316(b) and information on implementation of CWA §316(b) requirements. Because of SAIC's inability to locate certain primary documents, some of the information in this paper was gathered from secondary sources. When a secondary source has been used, this source has been cited.

The CWA establishes the general rule that the discharge of a pollutant from any point source is prohibited unless authorized by a permit. Under CWA 1402 and regulations set out in Title 40 of the *Code of Federal Regulations* (*CFR*) Parts 121-125, EPA or a State with an EPA-approved program may issue a National Pollutant Discharge Elimination System (NPDES) permit authorizing a pollutant discharge if the discharge meets the requirements of the CWA, including CWA §301 effluent limitations and CWA §306

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[1] 33 U.S.C. §§1251-1387 (1988). In this paper, the acronym "CWA" is used as a general term when referring to the statutory authority for the National Pollutant Discharge Elimination System program.

new source performance standards. Pursuant to the definition of "pollutant" in CWA §502(6), heat is a pollutant regulated under the CWA, bringing thermal discharges under the coverage of the NPDES program requirements. According to procedures set out in CWA §316(a), thermal effluent limitations established under CWA §§301 or 306 may be modified to a less stringent level if it can be shown that the modified levels are sufficient to protect a balanced indigenous population of fish, shellfish, and wildlife. CWA §316(b) mandates that any standard established by EPA pursuant to CWA §301 or CWA §306 and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

This paper is organized into five major sections. Section 2 discusses the legislative history of CWA §316(b). Section 3 provides a summary of the corresponding regulatory history. Section 4 presents information regarding legal interpretations of CWA §316(b) requirements. Section 5 provides information regarding how CWA §316(b) requirements have been implemented by the EPA Regions and States with EPA-approved NPDES programs (NPDES States). Finally, Section 6 proposed future steps to expand upon the information presented in this paper.

2. CWA §316(b) LEGISLATIVE HISTORY

2.1 Introduction

This section summarizes the legislative history of CWA §316(b). The discussion addresses Congressional motivation and intent, viewpoints of interested parties relative to the CWA §316(b) debate, the legislative

proposals and related negotiations, and the final conference report and CWA §316(b) compromise. Finally, this section concludes with a brief summary of the legislative activity regarding CWA §316(b) subsequent to passage of the FWPCA. Appendix A sets out those documents reviewed to compile the information in this section and briefly summarizes relevant coverage in each document.

In addition, this section presents historical legislative information regarding CWA §316(a). In general, the legislative history surrounding CWA §316 is focused on the control of thermal discharges. Thus, much of the legislative history addresses issues related to the control of the discharge of heat from power generating facilities. The issue of the design of cooling water intake structures was addressed in the context of the overall adverse environmental impact of the operation of the facilities in question. CWA §316(b) essentially was created as a result of compromises regarding statutory approaches to control thermal discharges.

To gather the information presented in this section, SAIC reviewed a variety of primary and secondary sources. Primary sources consisted of Congressional hearing transcripts and legislative history compilations prepared by the Environmental Policy Division of the Congressional Research Service of the Library of Congress or by EPA. Copies of primary sources were obtained from the EPA Headquarters Main and Legislative Libraries, the EPA Region V Library, the Library of Congress, and the libraries of both George Mason University and George Washington University. Secondary sources included books on the history of Federal water pollution regulation, environmental law

treatises, and law review and other articles identified through research. Information on current legislative proposals was gathered through review of the proposed bills and informal discussions with Congressional committee staff.

2.2 Nature of the Thermal Pollution Problem

Thermal pollution appears to have emerged as a critical water protection issue during the late 1960s.[2] Control of thermal discharges had not been addressed in the two major water legislative initiatives of that decade, the Water Quality Act of 1965 (P.L. 89-234) and the Clean Water Restoration Act of 1966 (P.L. 89-753). At that time, power plants, especially nuclear power facilities, were recognized as major water users and principal sources of thermal pollution. No Federal agency possessed adequate authority to prevent or control thermal pollution from such facilities. The Atomic Energy Commission (AEC), which was responsible for licensing nuclear power plants, claimed that it did not possess authority to consider thermal pollution when reviewing license applications.[3] It was

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[2] Clarence Davies III, *The Politics of Pollution* (New York: Pegasus, 1970), pp. 38-49. During the late 1960s, Congress began consideration of a series of pollution problems not addressed by the 1965 Water Quality Act and the 1966 Clean Water Restoration Act. Thermal effluent was one of the pollution issues considered. Also evaluated were such issues as oil pollution, acid mine drainage, eutrophication, , and vessel pollution. The bills proposed during the late 1960s to amend the Water Pollution Control Act (P.L. 80-845) addressed these topics. Both oil and thermal pollution were the most controversial of the issues covered.

[3] *Id.* at 46-47. As a result of passage of the National Environmental Policy Act (NEPA) in 1969 and its subsequent interpretation in *Calvert Cliffs, Coordinating Committee, Inc. v. Atomic Energy Commission*, 1 ELR 20346 (July 23, 1971), the

in this context that Congress sought to address the issue of the control of thermal pollution.

2.3 Legislative Attempts to Address Thermal Pollution in the 90th Congress

Between 1967 and 1970, Congress attempted to address the gap in regulatory authority to control thermal pollution. Extensive hearings were held on the issue during this period. In July 1968, Senator Edmund Muskie proposed language in S. 2525 to amend Section 11 of the Water Pollution Control Act that would mandate the consideration and control of thermal pollution. Under this proposal, all Federal agencies that carried out or issued leases, licenses or permits would be required to cooperate with the Secretary of Interior by certifying that authorized activities would not violate applicable water quality standards.[4] Thermal discharges were implicitly covered under this provision since a water quality standard was in place at the time for heat.

The "Section 11" proposal raised considerable controversy, facing opposition from within Congress,

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AEC began considering the environmental consequences of nuclear power plant operations at various stages of the licensing process. These activities led to an assessment of the environmental consequences of thermal effluent from nuclear power facilities. NEPA imposed a duty upon all Federal agencies to: (1) consider the effects of their decisions and activities upon the environment and to use whatever practicable means available to avoid environmental degradation and (2) follow procedural guidelines for ensuring that the substantive goals of NEPA were met. In *Calvert Cliffs*, the D.C. Circuit held that AEC was required to revise its rules governing the consideration of environmental issues.

[4] *Id.* at 47.

from the regulated community, and from the Executive Branch. Opposed to the provision were electric utilities and the Chamber of Commerce. The Army Corps of Engineers opposed interference with respect to its licensing of dumping and dredging material from rivers and harbors. The AEC defended the interests of the nuclear power, as well as overall electric utility industry.[5]

The House version of the Senate bill to amend the Water Pollution Control Act deleted the Senate's Section 11 provision. Rather than negotiate with the Senate through a conference committee, the House elected to seek Senate approval of its bills. Senator Muskie, however, refused to compromise on the Section 11 language. The Senate, in turn, passed a revised House bill restoring the revised Section 11. In the closing hours of the 90th Congress, the House agreed to a series of the Senate's technical amendments, but continued to delete the Section 11 revisions. The Senate did not respond to the House's latest action before the close of the 90th Congress. Thus, the session ended without legislative action on water pollution control.

2.4 Legislative Attempts to Address Thermal Pollution in the 91st Congress

Both the Senate and the House introduced similar legislation as produced in the 90th Congress during the 1969 91st Congress and held a number of committee hearings. Senator Muskie rewrote his version of Section 11 to shift responsibility for certification. Specifically, the language required applicants for a

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[5] *Id.*

Federal license or permit to obtain a certificate from the appropriate state agency indicating that activities authorized under the license or permit would not violate water quality standards. The House incorporated the revised Muskie language in its reintroduced bill, H.R. 4148. The Senate reported out a revised bill, and both were sent to a conference committee. In March 1970, the conference reported H.R. 4148; Section 11 was redesignated as Section 21, entitled "Cooperation by all Federal Agencies in the Control of Pollution." New Section 21(b) incorporated Senator Muskie's certification scheme, requiring State certification that a proposed discharge into navigable waters would not violate applicable water quality standards. The Senate agreed to the conference report on March 24, 1970, the House on March 25, 1970. On April 3, 1970, H.R. 4148 was approved as the "Water Quality Improvement Act of 1970" (P.L. 91-224).

2.5 Legislative Activity to Address Thermal Pollution in the 92nd Congress

In the 92nd Congress, the Water Pollution Control Act was finally amended to address thermal pollution and the technology of cooling water intake structures. The current version of CWA §316 resulted from a compromise regarding the regulatory schemes presented in House Bill 11,896 and Senate Bill 2770. CWA §316 has not been amended to date by subsequent legislation. This section summarizes the proposed House and Senate versions of CWA §316 and discusses issues related to the compromise version that resulted.

2.5.1 Summary of Proposed House Bill 11,896

The House version of CWA §316 was designed to regulate both the discharge of thermal pollution and cooling water intake structures at facilities discharging heat and would have presented a different approach from that used under the current CWA §316. Essentially, the House Bill would have incorporated cooling water intake structure regulation into the control of thermal discharges.

Under H.R. 11,896, thermal discharges were treated as a special type of pollutant. The House definition of pollutant included "heat" but not "thermal discharges in accordance with regulations issued pursuant to Section 316 of the Act."[6] This language allowed for the special regulation of thermal discharges. No uniform national technology standards for cooling water intake structures would have been established. Instead, H.R. 11,896 would have required EPA to develop regulations for the control of thermal discharges within one year of the statute's enactment that would "recognize that the optimum method of control of any thermal discharge may depend upon local conditions, including the type and size of the recovering body of water."[7] The House Bill would have mandated that EPA regulations require members of the regulated community to complete a process, similar to an environmental impact statement under

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[6] H.R. 11,896, 92d Cong., 2d Sess. (1972), *reprinted in* SENATE COMM. ON PUB. WORKS, 93D CONG., 1ST SESS., A LEGISLATIVE HISTORY OF THE WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972, at 1068 (1973) [hereinafter LEGISLATIVE HISTORY].

[7] *Id.* at 1043-45.

NEPA, to determine appropriate facility controls to minimize the effect of the given facility's discharge.[8] The House Bill would have provided that:

> [t]he regulations shall require any person proposing to make such a [thermal] discharge to consider all alternative methods for controlling such a discharge, involving, but not limited to (1) utilization of available water bodies or cooling devices, including once-through cooling, mixing zones, cooling ponds, spray ponds, evaporative or non-evaporative cooling towers, (2) dilution of heated waters with cooler waters, and (3) an alternation of the outlet configuration.[9]

By specifying these potential methods, the House Bill incorporated cooling water intake structure regulation into the provision for the control of thermal discharges. The proposed legislation also would have required that both EPA and the facility consider the above potential methods completely before a cooling water intake structure system could be utilized; in choosing among the possible technologies, EPA and the facility were to consider:

> (1) their relative engineering and technical feasibility, (2) their relative social and economic costs and benefits, (3) their relative impact on the environment, considering not only water quality but also air quality, land

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[8] *See* Karl R. Rábago, *What Comes Up Must Go In: Cooling Water Intakes and the Clean Water Act*, 16 HARV. ENVTL. L. REV. 429, at 447 (1992).

[9] H.R. 11,896, *supra note* 6, at §316(a), *reprinted in* LEGISLATIVE HISTORY, *supra* note 6, at 1043-45.

> use, and effective utilization and conservation of natural resources, and (4) methods of minimizing adverse effects and maximizing beneficial effects of such discharges.[10]

The House Bill also included a different approach to variances. Under the House version of CWA §316, variances to thermal discharge limitations could be granted when the economic and social costs of these limitations bore no reasonable relationship to the economic and social benefits.[11] In determining whether a variance was to be granted, EPA would have been required to compare all social costs, not only economic ones, to all benefits. In instances where the costs bore no reasonable relationship to the benefits, EPA could have permitted an "appropriate adjustment" consistent with the greatest degree of control reasonably achievable. This approach to variances from thermal discharge regulations differed from the method prescribed by the House in its proposed CWA §301 for other types of discharges. Under proposed CWA §301, a variance could be granted in situations where a facility could illustrate that it could not attain compliance "at a reasonable cost."[12]

Overall, the proposed House Bill would have allowed for regulation of cooling water intake structures through regulations that would have granted individualized consideration of facility differences and for some modification of regulatory requirements on a site-by-site basis without sacrificing maximum achievable control. The House version

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[12] H.R. 11,896, *supra* note 6, at §301(b)(2)(A), *reprinted in* LEGISLATIVE HISTORY, *supra* note 6, at 964.

would have required each steam electric generating facility with thermal discharges to engage in a full environmental impact assessment of the ecosystem, the facility itself, and the entire range of alternative technologies, including retrofit of intake and discharge structures.

2.5.2 Summary of Proposed Senate Bill 2770

The Senate Bill [13] addressing water pollution control contained no provisions specifically addressing thermal discharges or significantly affecting the choice of cooling water intake structure technology. Like its House counterpart, the Senate version included heat in its definition of a pollutant; however, unlike the House Bill, there was no exemption from coverage of thermal discharges that were in compliance with more specific discharge limitations. Thus, under the Senate, thermal discharges would be regulated like any other pollutant.

In addition, the Senate approach did not require consideration of alternatives or mitigation measures that might influence the choice of cooling water intake structure technologies. Instead of requiring the consideration of intake effects as a component of thermal discharge regulation, the Senate version would have mandated the establishment of general discharge standards; under this approach, EPA could develop a site-by-site approach to regulating cooling water intake structures. Thus, cooling water intake structures would have only been regulated as an indirect result of

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13 S.2770, 92d Cong., 1st Sess. (1971), *reprinted in* LEGISLATIVE HISTORY, *supra* note 7, at 1534.

the Senate Bill's regulation of technologies used to control thermal discharges. [14]

2.5.3 Conference Compromise

When the two bills moved to Conference Committee, the issue remained as to whether thermal discharges were sufficiently unique to justify their own regulatory regime, as in the House Bill, or whether they should be treated as any other pollutant subject to the CWA's general limitations and guidelines, as in the Senate Bill. The method of control of cooling water intake structure effects was affected by each approach. Under the House approach, the consideration of harmful intake effects would have been a component of thermal discharge regulation. Conversely, the Senate Bill did not directly address cooling water intake effects.

The version of CWA §316 that was finally adopted incorporated the Senate's basic approach to control of thermal discharges. Heat remained a pollutant in the CWA definitions section; however, the consideration of intake alternatives or mitigation measures was not required for the issuance of an NPDES permit to discharge heat. Little explanation in the formal conference report or in the debates surrounding the final version of the amendments offers insight into the reasons behind the compromise. [15]

The final version of CWA §316 required a two-pronged approach to the regulation of thermal discharges and cooling water intake structures. First,

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[14] *See* Rábago, *supra* note 8, at 453.

[15] See S. REP. NO. 1236, 92d Cong., 2d Sess. (1972), *reprinted in* 1972 U.S.C.C.A.N. 3776.

an NPDES permit for a facility discharging heat must require compliance with effluent limitations developed pursuant to CWA §301 or new source performance standards developed under CWA §306; however, CWA §316(a) allows a facility to seek a variance from strict application of CWA §301 or CWA §306 requirements. To obtain such a variance, the facility must show that the proposed limitation is "more stringent than necessary to assure the [protection] and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made...." Upon such a showing, EPA is authorized to impose a less stringent thermal limitation if it is determined that the ecological balance is maintained.

Because CWA §§301 and 306 address pollutant discharges only, a separate provision specifically addressing cooling water intake structure technology was needed. Thus, CWA §316(b), the only section of the CWA dealing exclusively with intakes, states that

> [a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures; reflect the best technology available for minimizing adverse environmental impact. [16]

Through this provision, Congress created another technology standard, the "best technology available" (BTA) standard, for dealing with cooling water intake structures. The only legislative history that addresses the subject indicates that BTA should be interpreted

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[16] U.S.C. §1326(b).

as "best technology available commercially at an economically practicable cost." [17] The BTA standard is to be applied whenever a cooling water intake structure is used at a facility subject to NPDES permitting requirements.

2.6 Subsequent Legislative Activity Regarding CWA §316(b)

The CWA was amended in 1977 [18], 1981 [19], and 1987 [20], with no revisions being made to CWA §316. In the current CWA reauthorization process, one bill would have deleted §316(b), while the most current proposals leave the provision in place.

In past legislative debate on CWA amendments, some emphasis was placed on revising the CWA §316(b) requirements. In 1982, EPA proposed to Congress revisions to create two CWA §316(b) standards, one for new sources, and another for existing sources. [21] Under the EPA proposals, new

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[17] *See* 118 CONG. REC. 33,762 (1972), *reprinted in* LEGISLATIVE HISTORY, *supra* note 6, at 264 (Statement of Representative Don H. Clausen).

[18] Clean Water Act Amendments of 1977, Pub. L. No. 95-217, 91 Stat. 1566 (1977))

[19] Clean Water Act Amendments of 1981, Pub. L. No. 97-117, 95 Stat. 1631(1981))

[20] Clean Water Act Amendments of 1987, Pub. L. No. 100–4, 101 Stat. 7 (1987)

[21] *Clean Water Act Amendments of 1982: Hearing on S.777 & 2652 Before the Subcomm. On Environmental Pollution of the Comm, on Environment and Public Works*, 97th Cong., 2d Sess. 279, at 318-19 (1982). EPA also proposed three modifications to the variance provisions in §316(a). First EPA proposed that the CWA should permit EPA to grant a thermal variance upon a showing that the discharge would cause no impairment to the

sources would still have to utilize the best technology available for minimizing adverse environmental impact. Existing point sources could satisfy CWA §316(b) by applying either the best technology available or "other equally effective measures" that alone or in combination with "best available technology" would minimize adverse impact.[22]

EPA testimony indicated that the Agency felt that the requirements of CWA §316(b) were too stringent. The Edison Electric institute (EEI) argued that CWA §316(b) allowed EPA to conclude that adverse intake effects could be minimized only by means of technical modifications to location, design, construction, or capacity of intake structures. EEI sought clarification of whether minimizing adverse impacts might also be accomplished through non-intake structure responses, such as fish hatcheries or stocking programs. Despite this testimony and relatively mild objection to change from environmental groups,[23] Congress did not revise CWA §316 in 1982.

Congress has over the past two sessions addressed CWA reauthorization. Senate Bill 1081, proposed in the last Congressional session, would have deleted CWA §316(b) and designated the provision as being "reserved." The current Senate reauthorization bill, S.1114, would leave CWA §316(b) as is. A House bill

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water quality standards established by the states. Second, EPA proposed that the CWA should permit EPA to grant a variance upon a showing that a balanced population of shellfish, fish, and wildlife would remain in and on the water. Third, EPA proposed that the CWA should allow a State to make the determination of balanced population. These proposals were not adopted.

22 *Id.*

23 See Rábai, *supra* note 8, at 473.

was recently introduced in March 1994 (The Water Quality Act of 1994, H.R. 3948); preliminary research has indicated that this proposal would not revise CWA §316(b).

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5. EPA REGIONAL AND NPDES STATE IMPLEMENTATION OF CWA §316(b) REQUIREMENTS

5.1 Introduction

Although EPA has not promulgated regulations under CWA §316(b) setting standards for cooling water intake structures, standards related to the design and operation of such structures have been included in NPDES permits issued by the EPA Regions and NPDES States. As a result, the Regions and NPDES States have played a large role in the development of regulatory standards related to cooling water intake structures. As EPA is considering formally addressing this issue by regulation, having a perspective on Regional and State activity, and the strengths and weaknesses of such approaches, could assist in this endeavor.

This section addresses three major topics. First, the section summarizes information gathered regarding EPA Regional implementation of CWA §316(b) requirements through EPA issued NPDES permits. Second, the section presents information on how NPDES States have approached the regulation of cooling water intake structures. Finally, the section summarizes preliminary data obtained regarding the status of CWA §316(b) determinations made in the EPA Regional and NPDES State permitting programs.

5.2 EPA Regional Activities Regarding CWA §316(b) Implementation

To gain an understanding of how CWA §316(b) is being implemented in the EPA Regions, SAIC conducted an informal survey. Representatives familiar with the CWA §316(b) activities in each Region were first identified. A list of the identified EPA Regional representatives is provided in Appendix G. Representatives from each of the 10 EPA Regions were then sent letters via telefax informing them that they were going to be contacted and outlining the types of information that would be asked of them. Each representative was then contacted by telephone and information was requested regarding:

- Major CWA §316(b) determinations made in the Region and whether they were based on previous determinations and/or whether they served as the basis for subsequent determinations
- Facilities other than steam electric which were required to demonstrate compliance with CWA §316(b)
- Major technologies used in the Region to "minimize adverse environmental impacts" and any information on operational characteristics, efficiency, and frequency of use of these technologies
- Existing list/inventories of CWA §316(b) determinations made in the Region
- Whether technological modifications/fixes had been required as a result of determinations made in the Region

- Available reports or other documentation from Regional CWA §316(b) determinations.

Responses to the request for information were limited. The low response rate could be attributed to the fact that the phone calls were initially made at the end of the government's fiscal year when workloads are generally higher than usual. Some of the Regional representatives contacted stated that they just did not have the time to put towards researching the information needed. Many of the representatives, however, did not have the information available to them because CWA §316(b) requirements were being implemented by NPDES States in their Regions. Additional calls made to several of the Regions after the start of the new fiscal year did not yield any additional information. The data collected as a result of the informal Regional survey are summarized below. Responses to the questions are presented below in sequential order by EPA Region.

Region I

EPA Region I has made the following major CWA §316(b) determinations for steam electric facilities:

- Seabrook Station (Public Services Company of New Hampshire)
- Pilgrim Station (Boston Edison Company)
- Brayton Point Station (New England Power Company).

In addition, several smaller steam electric facilities with generating capacities of less than 100 Megawatts (MW) have been required to demonstrate compliance. No other industries beyond steam electric have been

required to show compliance with CWA §316(b) requirements.

Determinations made with respect to the Seabrook Station in New Hampshire set the precedent for several subsequent CWA §316(b) determinations. The decision for the Brayton Point Station required modifications to the screens. This decision was based on a determination made at the Indian Point Facility in New York.

In general, fish return systems have been required at all steam electric plants in Region I to minimize aquatic and environmental impacts. Other technologies required under CWA §316(b) have included the following:

- At the Seabrook Station, long intake tunnels which allow the facility to withdraw cooling water from an area where it will cause less environmental impact and that are outfitted with vertical mid-depth openings and velocity caps have been required.
- At the Brayton Point Station, slant screens with a pumped fish return have been required.
- At the Mystic Station (Boston Edison Company), sills have been required in front of the intake structure to deter flounder.

The intake control technology that was required at the Seabrook Station has reduced impingement of that facility to only 1,000 fish per year. Region I has documentation of additional operational characteristics, efficiencies and frequency of use for control technologies at Seabrook and other facilities.

There are no lists or inventories of CWA §316(b) determinations available in the Regional office. In

addition, the Region does not have reports for past determinations.

Region II

EPA Region II has made the following major CWA §316(b) determinations:

- Indian Point (Power Authority of State of New York)
- Half-Moon Station (Inter-Power of New York).

Other determinations were probably made in the 1970s and 1980s; however, such information was not provided or available at the time of the interview. Facilities other than steam electric have not been required to demonstrate compliance with CWA §316(b) requirements.

The Indian Point facility in New York was required to provide modified Ristroph traveling screens, a low pressure wash system, a fish return, and a fish hatchery. The facility may also have been required to install a sound barrier. No information is available in Region II's records documenting operational characteristics, efficiencies and frequency of use of the technologies required.

The representative contacted indicated that he would send additional information on the CWA §316(b) activities; however, no information has been received to date.

Region III

The representative contacted in Region III stated that the States have been making CWA §316(b) reviews and determinations for at least 10 to 14 years with little or no Regional oversight. A determination was made for the Eddy Stone Power Plant

[Philadelphia Electric Co. (PA)] approximately five years ago; however, the details of the determination were unknown to the EPA Regional representative except that the determination was based on the State of Pennsylvania's criteria for best technology available at the time. Few if any of the CWA §316(b) determinations in the Region have required modification of existing intakes.

Industries other than steam electric have not been required to demonstrate compliance with the requirements of CWA §316(b) in the Region.

There are no inventories or other information available in the Region III office on the status of CWA §316(b) activities.

Region IV

EPA Region IV has made the following major CWA §316(b) determinations for steam electric facilities. The name of the facility, the date of the determination and the intake modification/mitigation measures are provided:

- Northside Power Plant, Jacksonville Electric Company, FL, February 17, 1977. Intake modification/mitigation measures: installation of return mechanism for impinged organisms.
- Brunswick Steam Electric Plant, Carolina Power & Light Company, NC, November 11, 1977. Intake modification/mitigation measures: reduction of intake flows at certain times, installation of fixed screens at the mouth of plant intake canal, installation of fine mesh screens at the plant intakes, and installation of an impinged organism return system.

- Big Bend Station, Tampa Electric Company, FL, June 12, 1981. Intake modification/ mitigation measures: installation of fine screens on Units 3 (retrofit) and 4 and an impinged organism return system; dilution pump use was discontinued.
- Crystal River Power Plant, Florida Power Corp., FL, September 1, 1988. Intake modification/mitigation measures: reduction in intake flows at certain times and installation of a fish hatchery and program of restocking.
- John Sevier Power Plant, Tennessee Valley Authority, TN, April 15, 1986. Intake modification/mitigation measures: Fish restocking program.

Several of the determinations made in Region IV have been based on other determinations made within the Region or in other Regions. They are as follows:

- The mitigation measures provided for the Brunswick Steam Electric Station were based in part on prototype studies of fine mesh screens at the Big Bend Station
- The Crystal River mitigation measures were based in part on the Seabrook and Brunswick decisions.
- The Regional determination that the intake dam at the John Sevier Power Plant is a component of the plant intake structure may set a precedent (although the determination was not adjudicated or litigated) for sites where a dam has been constructed across the intake water body to produce an intake impoundment.

In addition to requirements for the steam electric industry to demonstrate compliance with CWA §316(b) requirements, at least one steel mill was required to conduct a CWA §316(b) study; however, the permit was adjudicated and no knowledge is available as to whether the study was ever actually conducted.

Intake technologies used to reduce impacts in Region IV have included the following. Facilities where these technologies have been installed are also provided:

- Fine mesh screens: Big Bend and Crystal River Stations.
- Impinged organism return systems: Big Bend, Brunswick, and Northside Stations.
- Offshore ocean intake with a velocity cap: St. Lucie Nuclear Power Plant, Florida Power and Light Company, FL.
- Johnson screens (in cooling to intake system): Seminole County Power Plant, Seminole Electric Company, FL.
- Submerged, offshore, perforated pipe to an onshore intake structure (in cooling tower intake system): East Bend Station, Cincinnati Gas & Electric Company, KY.
- Submerged weir (to intake water from deeper and generally less productive portions of the intake water body): Numerous Tennessee Valley Authority and Duke Power Company plants.
- Fixed screen at the mouth of the intake canal: Brunswick Steam Electric Plant.
- Infiltration wells (to eliminate the direct use of a water intake from a surface stream): Grand Gulf

Nuclear Station, Systems Energy Resources, Inc., MS.

- Reduced flow during portions of the year: Anclose Power Plant, Crystal River Power Plant, and Brunswick Nuclear Plant.

Mitigation measures that have been required where technology is insufficient or wholly disproportionate in cost include: fish hatchery and/or restocking programs such as that implemented at the Crystal River and John Sevier Stations.

Information available from Region IV on the operational characteristics, efficiencies, and frequencies of use of these technologies is as follows:

- At the Big Bend Station, survival of returned organisms at: (1) average survival all eggs and larvae is approximately 75 percent, (2) crustacean survival is 90+ percent, and (3) various species of drum were at best 50 percent.
- With the exception of intake flow reduction (required only at specified times), generally, all cooling water intake facilities are operated continually.

Region IV has an updated inventory of CWA §316(b) activities which is based on the Utility Data Institute study conducted for EPA in 1981. A preliminary update of the Inventory is provided in Appendix H of this document. This update, however, remains to be verified by the Regional representative. Additional CWA §316(b) historical information covering EPA Region IV and other Regions may be available from the Region IV representative.

Region V

The representative contacted in Region V believes that no CWA §316(b) determinations have been made in the Region since 1988; however, Michigan has several studies currently underway. Historical information on CWA §316(b) was not available because the files were destroyed in the late 1970s.

In addition to requiring determinations at steam electric facilities, Region V has required studies at steel mills; however, modifications to the intakes have never been required.

Intake technologies used to reduce impacts in Region V have included: (1) nets installed at the mouth of the intake canal at the Pulliam Station, WI Public Service Corporation, and Quad Cities Station, Commonwealth Edison Company, IL; and (2) Johnson Screens (offshore) installed at the Campbell Station, Consumers Power Company, MI. No information on the operational characteristics, efficiencies, and frequency of use of these technologies was available from the Region. In general, it is known that no major modifications have been required on existing intake structures in the Region.

There are no inventories available in the Regional program office on the status of CWA §316(b) activities. There are numerous studies, reports and determinations available, however, in the Region V library on CWA §316(b) determinations made in the area of the Great Lakes. In particular, there is a detailed report on Lake Michigan cooling water intake structures.

Region VI

No information was provided by the Region VI representative at the time of the interview. Information was promised after September 30, 1993. To date, no information has been received. Follow-up calls have not yet been made.

Region VII

The Gerald Gentlemen Station, Southerland Reservoir, Nebraska Public Power District is the only facility where Region VII has required modifications. The Regional representative believed that only changes in operational procedures were required at the facility. This determination was made by the Nebraska Department of Environmental Quality.

No industrial facilities other than steam electric have been required to conduct CWA §316(b) demonstrations.

Region VIII

Information was unavailable from the Region VIII representative. To his knowledge, there has been no work conducted on CWA §316 since the early 1970s, nor have there ever been any CWA §316(b) studies conducted.

Region IX

The representative contacted in Region IX stated that there is no one currently familiar with CWA §316(b) activities in the Regional office. He believes there have been one or two Pacific Gas & Electric Company plants that have conducted CWA §316(b) demonstrations in the past; however, the details regarding these demonstrations are not available.

Each of the determinations were unique situations; no precedent for CWA §316(b) determinations has been set in the Region. No facilities other than steam electric have been required to conduct CWA §316(b) demonstrations.

Based on information from sources other than the Regional representative, it is known that in recent months, three facilities have been required to submit demonstration studies. These facilities include:

- San Onofre Nuclear Generating Station (Southern California Edison)
- South Bay Plant (San Diego Gas & Electric)
- Encina Power Plant (San Diego Gas & Electric).

These demonstrations were recently reviewed by EPA Region IX and are presently under review by the State of California.

The major technology used in Region IX for cooling water intakes has been deep ocean intakes installed with velocity caps.

There are no existing inventories in the Region documenting the status of CWA §316(b) activities, nor is there any information available to generate an inventory. Information does not exist on the technologies used in the Region to minimize adverse environmental impacts or on the efficiencies, operational characteristics or frequency of use of technologies.

Region X

Representatives familiar with the CWA §316(b) activities in Region X have not been identified to date. The contact listed in the appendix, who has been kind enough to aid in identification of a representative,

however, had not been successful when the last follow-up call was made.

5.4 Information on NPDES State Requirements Related to Cooling Water Intake Structure

Although all NPDES States are required to implement and enforce regulatory requirements as part of their State programs that are at least as stringent as those imposed by EPA, the lack of formally promulgated regulations addressing CWA §316(b) requirements has led to uneven treatment of this issue at the State level. To obtain information on NPDES State cooling water intake structure regulatory requirements, SAIC reviewed the water pollution control statutes and regulations of the 40 NPDES States. The review focused on regulatory requirements of the States' NPDES permitting programs and on regulations governing water quality standards. The review attempted to identify State statutory or regulatory provisions that specifically addressed technology requirements for cooling water intake structures located at facilities with point source discharges. Appendix F summarizes the results of the NPDES State statutory and regulatory review.

While the review indicated that all NPDES States have addressed thermal discharges and many have statutory or regulatory provisions similar to CWA §316(a) that outline procedures for variances from thermal discharge limits upon a demonstration of no adverse impact, few NPDES States have specifically addressed cooling water intake structure technology specifically by statute or regulation. A number of NPDES States' water quality standards also addressed withdrawals from surface water bodies in ways that could be applied to cooling water intake structures.

Summarized below are several of the State provisions identified related to requirements for cooling water intake structures and cooling water withdrawals. The requirements most closely conforming to CWA §316(b) are described first, followed by other examples of how NPDES States have partially addressed this issue. Summaries of State provisions addressing thermal discharge variances have not been included. Also, additional information on State regulatory requirements is included in Section 5.4.5.

5.4.1 State Provisions Specifically Addressing Cooling Water Intake Structure Technology

Research indicated that three NPDES States have specifically addressed cooling water intake structure by statute or regulation. The regulatory requirements of these NPDES States are summarized below.

- California's Water Quality Control Act includes several provisions that address issues related to the protection of the marine environment related to thermal discharges and cooling water intake structures. One provision requires that each new or expanded coastal power plant or other industrial installation using seawater for cooling, heating or industrial processing must use the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. Another provision requires advance preparation of independent baseline studies of the existing marine system in the area that could be affected by new or expanded industrial facilities using seawater for these purposes. Because these provisions were not located in

State regulations, it is likely that they are implemented through the Regional Water Control Plans developed by the California Regional Water Quality Control Boards.

It appears that California regulates inland intake structures pursuant to a policy statement issued in 1975 and a number of CWA §316(b) determinations made prior to 1980. The policy statement provides that the least preferable source of cooling water consists of non-waste inland waters and that approval of fresh inland waters for cooling use will occur only upon a "demonstrat[ion] that the use of other water supply sources or other methods of cooling would be environmentally undesirable or economically unsound." The policy requires the preparation of an environmental impact statement for new cooling water use or changes in use and requires permits to include provisions for future monitoring and studies. Although the California policy appears to be a tool that would be effective in CWA §316(b) regulation, it is oriented primarily to water consumption. Impingement and entrainment issues are not addressed.[24]

- Illinois NPDES regulations require that "[n]ew water intake structures on waters designated for general use, whose construction begins after the effective date of this Chapter, shall be so

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24 See Rábago, *supra* note 8, at 476. The California policy itself was not reviewed; information provided was adapted from the Rábago article.

designed as to minimize harm to fish and to other aquatic organisms."

- Indiana's water quality standards addressing temperature limits include requirements for cooling water intake structures. Pursuant to these regulations, intake structures must be designed and located to minimize entrainment and damage to desirable organisms. The standards state that while requirements may vary depending on local conditions, in general, intake structures must have minimum water velocity and may not be located in spawning or nursery areas of important fisheries. Water velocities at screens and other exclusion devices also must be minimized. In addition, Indiana's regulations provide opportunity for the regulated community to request a decision on whether cooling water intake structures meet BAT under CWA §316(b).
- Maryland is the NPDES State that appears to have the most comprehensive requirements related to cooling water intake structures. The regulations first mirror the language in CWA §316(b), requiring that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. BTA is based on consideration of both impingement loss and entrainment loss, and dischargers must make modifications to their facilities to mitigate both. First, dischargers are required to install and operate modifications to limit impingement, provided that costs associated with State required modifications

over a five year period may not exceed five times the estimated annual value of impingement loss as determined by procedures in the regulations. Second, regarding entrainment losses, the discharger is required to determine the extent of entrainment loss on a "spawning or nursing area of consequence" as defined in other State regulations. The regulations provide that if entrainment loss results in "significant environmental impact," the discharger must install and operate functional modifications to mitigate entrainment loss. All requirements are waived for facilities withdrawing less than 10 million gallons per day if the volume withdrawn is less than 20 percent of the design stream flow for nontidal waters or the annual average net flow past the discharge point that is available for dilution for tidal waters.

5.4.2 State Provisions Referring to CWA §316(b) or Federal Regulations

Several NPDES States have included language in State statutes or regulations that reference either CWA §316 or 40 *CFR* Part 125, Subpart I, the section of the NPDES regulations that is reserved for criteria applicable to cooling water intake structures to be developed under CWA §316(b). Examples are provided below.

- Arkansas' water quality standards antidegradation policy requires consistency with CWA §316 in cases where potential water quality impairment is associated with thermal discharges.

- Iowa water pollution control regulations incorporate Federal effluent and pretreatment standards by reference. Standards for cooling water intake structures are reserved.
- New Jersey NPDES regulations state that "the criteria applicable to cooling water intake structure shall be as set forth in 40 *CFR* Part 125, Subpart I."
- New York NPDES regulations require that "[t]he location, design, construction and capacity of cooling water intake structures, in connection with point source thermal discharges, shall reflect the best technology available for minimizing adverse environmental impact."

5.4.3 State Provisions Governing Withdrawals From Surface Water

Several NPDES States were found to have statutory or regulatory provisions imposing requirements on water withdrawals. All provisions described below were found in the temperature section of the State water quality criteria.

- Colorado's discharge permit regulations are applicable to activities including the diversion, carriage, or exchange of water from or into streams and other water bodies, but the context is related to water use rights.
- Georgia's water quality control regulations and standards require permits for surface water withdrawals greater than 100,000 gallons per day. The requirement emphasizes water quantity and conservation rather than ecosystem impacts.

- Minnesota's water quality standards address withdrawal of water from certain types of surface water bodies as part of the temperature criteria for discharges. Provisions addressing temperature include a condition prohibiting withdrawal from and discharge to the hypolimnion in lakes or reservoirs, unless it can be shown that the discharge or withdrawal will be beneficial to water quality.
- Nebraska's temperature criteria include a provision for impoundments stating that unless a special study shows that the discharge of heated effluent into the hypolimnion will be desirable, such practice is not recommended, and water for cooling should not be pumped from the hypolimnion to be discharged to the same body of water.

5.4.4 State Provisions Governing Alteration of Habitat or Resource Impacts

Many State statutes and regulations address alteration of habitat due specifically to discharges of pollutants. Several State rules are not limited to alterations caused by discharges of pollutants and some broaden the cause of alteration to any anthropogenic activity.

- Arkansas water quality standards prohibit physical alterations of habitat in water bodies of certain use designations. Use designations are defined by fish communities supported.
- Connecticut water pollution regulations require coordination with other Federal and State agencies with jurisdiction over fish, wildlife or public health. These organizations may

recommend the imposition of conditions in permits necessary to avoid substantial impairment of fish, shellfish, or wildlife resources.

- The Iowa water quality standards antidegradation policy states that any proposed activity modifying the existing physical, biological, chemical integrity of a water of the State shall not adversely impact these attributes, either on an individual or cumulative basis. An adverse impact includes loss or irreparable damage to aquatic, semiaquatic, or wildlife habitat or populations.

5.4.5 Information on NPDES State Activities Regarding CWA §316(b)

Several NPDES States were contacted by phone to identify representatives familiar with the State's CWA §316(b) program and to attempt to collect the same information as from the EPA Regional contacts. Because of budgetary restraints and the Office of Management and Budget's regulations concerning surveys, only a small sampling of NPDES States were contacted for this assessment. Calls were made to Illinois, Pennsylvania, Wisconsin and Maryland. Only representatives in Pennsylvania and Wisconsin could be identified. The following discussion summarizes the information concerning CWA §316(b) activities collected through direct discussions with representatives from these two States.

Pennsylvania

The State of Pennsylvania has been implementing CWA §316(b) requirements since the mid 1970s. All facilities that take in water at a rate of greater than

one-half foot per second have been required to conduct demonstrations. The facilities for which determinations have been made include all steam electric facilities and several paper mills, refineries and steel mills. For the majority of the facilities, existing intake technologies have been determined to be equivalent to best technology available. Those with unfavorable determinations have been required to install wedge-wire screens, which are considered to be best technology available.

The most recent CWA §316(b) determination made includes the Eddy Stone Facility (within the last five years). A BP Oil Company facility is presently under study. The majority of the facilities in the State had determinations made in the 1970s and 1980s. The CWA §316(b) requirements are not implemented in conjunction with Pennsylvania's NPDES permitting program, but rather are part of a separate program.

It is unclear under which statutory or regulatory provisions the State implements these requirements. A review of the regulatory provisions cited by the State contact indicates that such provisions address thermal discharge limitations and do not specifically address cooling water intake requirements.

Wisconsin

The State representative indicated that little activity regarding CWA §316(b) requirements since the 1970s. Steam electric plants built at that time were often built with generous capacity to allow for growth. Thus, no new plants have been built since that time, and there has been no need for new determinations. Region V would like the State to revisit CWA §316(b) best technology available determinations at permit

reissuance; however, the State is reluctant to comply with this request because of the potential politics involved (i.e., the fishing industry is powerful in the Great Lakes area).

Most of the determinations have been made for steam electric plants. In general, if the cooling water intake flow is high, other industrial facilities may be required to conduct a CWA §316(b) demonstration. The State representative did not know what other industries may have been considered in the past.

Recent CWA §316(b)-related activities within the State have included studies performed four years ago to evaluate impingement of alewife in cooling water intake structures located on Lake Michigan. The State had originally considered a ban on commercial fishing of alewife in the lake because of dwindling populations. The fisherman, however, refuted the ban saying that the majority of the fish were being taken into the many cooling water intakes. The study was therefore initiated to isolate the cause of the problem.

The State representative was not familiar with what types of technologies have been considered best technology available in the past. Most recently, the State has determined that acoustics or sound barriers are BTA based on the results of the studies in Lake Michigan. No inventory on CWA §316(b) activities has been maintained in the State.

An additional call to State officials was made to identify statutory or regulatory provisions under which the State imposed cooling water intake structure requirements. SAIC review of the State NPDES statute and regulations identified no provision that specifically addresses this issue. State officials indicated that withdrawals from surface waters are

regulated under separate statutory provisions, which are primarily directed at limitations on withdrawals and impose certain reporting requirements. These provisions were not available for review.

5.5 Available EEI Power Statistics Database CWA §316(b) Status Information

As part of the overall effort to characterize the current state of affairs with respect to CWA §316(b) activities, efforts were made to gather information on facility status. As discussed in Paper 2, the Edison Electric Institute's (EEI's) Power Statistics Database (EEI, 1988-1991) contains information for every conventional, utility-owned steam electric plant in the United States. The subfile within the database entitled, UDESIGN2, contains fields that are related to the status of CWA §316(b) activities. This status information can be related to individual generating units at each of the reporting plants.

The version of the EEI Power Statistics Database available for this study is dated 1988-1991; therefore, data contained in the database are several years old. The information, however, was considered valid for the purposes of this study since CWA §316(b) activities are not occurring at a fast rate.

The information in the database was compiled by linking the CWA §316(b) status information with each of the steam electric generating units in each of the States and territories. Status information is not presented in the database for units located in the States of Colorado, Idaho, South Dakota, and Oregon. The reason for the exclusion of data for units in these States was not investigated. Quality control checks of the data gathering tools and verification procedures

used in the development of the database are needed to evaluate this issue.

The main limitation in using the database to determine CWA §316(b) status is that the status fields under which the units are presently categorized are not well defined and, in some cases, seem ambiguous. Additional information on how the information was obtained and categorized, including the survey questions that were posed to plant operators, would allow for better interpretation of the information provided. The CWA §316(b) status information in the EEI Power Statistics Database may provide a basis for a future inventory; however, the existing information should first be validated.

The database includes generating units currently in commercial operation, units under construction, planned units (still under design), units on standby or in economic reserve, deactivated units, sold units and units retired over the last five to eight years (EEI 1993). Within the database, 10 codes are used to reflect the status of CWA §316(b) activities for each generating unit. A listing and definition of each of the 10 codes is presented below (EEI, 1993):

- AP Existing intake structure approved.
- NR No monitoring required. In essence, existing structure acceptable or plant used very infrequently.
- RV 316(b) demonstration report has been submitted to permit agency and is under review at State or Regional level.
- ND No determination on applicability.
- PR Monitoring program is in progress at company level. Nothing submitted to agency.

- DR Demonstration rejected.
- AM Existing intake approved with modifications; further monitoring required.
- CA Existing structure conditionally approved; further monitoring is required.
- AN Existing intake approved with modifications; no further monitoring is required.
- HA Administrative adjudicatory hearing scheduled or in progress.

Table 5.1 summarizes CWA §316(b) status as provided in the EEI Power Statistics Database (EEI 1991). The status is given for the units within each State (excluding the four States that are missing from the database as discussed in Section 5.2.1 of this paper).

Table 5.1 Distribution of Operational Units by State and CWA §316(b) Status

State	CWA §316(b) Status										
	AP	NR	RV	ND	PR	DR	AM	CA	AN	HA	Total # Generating Units Classified for State
AK				1							1
AL	41	2	1		2						46
AR	4										4
AZ		2							-		2
CA	67		13		2						82
CT	18										18
CO											0
DC		2									2
DE	9				3						12
FL	52	5		11							68
GA	10	34					7		1		52

Table 5.1 Distribution of Operational Units by State and CWA §316(b) Status (continued)

State	CWA §316(b) Status										
	AP	NR	RV	ND	PR	DR	AM	CA	AN	HA	Total # Generating Units Classified for State
GU					4						4
HI	14	4	4								22
IA	32	2		1				5			40
ID											0
IL	54	15	14		15						98
IN	56	4	6	2	2						70
KS	3	18		1							22
KY	46	3		1							50
LA	6	1		15							22
MA	34				2						36
MD	12	6	8		1						27
ME	10										10

Table 5.1 Distribution of Operational Units by State and CWA §316(b) Status (continue

State	CWA §316(b) Status										
	AP	NR	RV	ND	PR	DR	AM	CA	AN	HA	Total # Generating Units Classified for State
MI	56	3	14			10					83
MN	35	4	3								42
MO	23										23
MS	14										14
MT				1							1
NC	17	27									44
ND		4		4							8
NE	10										10
NH	5										5
NJ	7	1	25		6						39
NM				4							4
NV		4			3						7

Table 5.1 Distribution of Operational Units by State and CWA §316(b) Status (continued)

State	CWA §316(b) Status										
	AP	NR	RV	ND	PR	DR	AM	CA	AN	HA	Total # Generating Units Classified for State
NY	64	14	4	1							83
OH	55	7	15	25							102
OK	6	4		8							18
OR											0
PA	51	10		1	3						65
PR	4	6	2								12
RI	3										3
SC	35	2									37
SD											0
TN	35		4								39
TX	26	16		19	2						63
UT		1									1

Table 5.1 Distribution of Operational Units by State and CWA §316(b) Status (continued)

State	CWA §316(b) Status										
	AP	NR	RV	ND	PR	DR	AM	CA	AN	HA	Total # Generating Units Classified for State
VA	23		5	2							30
VI	1										1
VT	1										1
WA				5							5
WI	60		4								64
WV	16	13	2								31
WY							3				3
Totals	1015	214	124	102	45	10	10	5	1	0	1526
Percent	67	14	8	7	3	<1	<1	<1	<1	0	100

It should be noted that the figures contained in Table 5.1 are for individual steam electric generating units as opposed to facilities as a whole. Each facility may have one or more generating units. In addition, it should be noted that the total number of units which have been documented in the database is 2,417. The total number of units which have been classified as to their CWA §316(b) status is only 1,526. Thus, only 63 percent of the existing units are represented in this analysis. Further analysis of background documents supporting the database necessary to determine the status or reasons for the missing 37 percent of the generating units.

In general, the CWA §316(b) data in the EEI Power Statistics Database indicate that the majority of the generating units documented (approximately 80 percent) have had existing intake structures approved under CWA §316(b). Included in this majority are those units with the status codes AP and NR. These two codes appear to be similar in that the existing structure is to have been approved, but it is not clear whether monitoring was originally required in the AP category, or whether it was subsequently required.

The database also shows that the number of operational generating units which are currently under review by the permit agency (code RV) is nine percent of the total operational generating units documented. It is not known whether these units were required to submit demonstrations recently or whether they may have submitted the demonstrations long ago and the permitting agency has just not made a determination. In addition, six percent of the units are coded ND meaning no determination on CWA §316(b) applicability has been made. It is not clear whether

these facilities have been considered or whether the facilities have only submitted information and a determination is pending.

In the database, three percent of the operational generating units are coded PR. This status code is for generating units that are currently performing monitoring for CWA §316(b) demonstrations but have not yet submitted the studies to the regulatory agency. Approximately one percent of the total units are coded under the remaining categories which include: (1) those where the demonstrations have been rejected; (2) those where the existing intake has been approved with modifications and monitoring has or has not been required; and (3) those where the existing intake structure has been conditionally approved and further monitoring has been required. No States have determinations coded as being under the administrative adjudicatory hearing, scheduled or in progress status.

Of interest in Table 5-1 is that there are four States where all of the units listed for the state are coded ND, meaning determinations on CWA §316(b) applicability have not been made. These States include Alaska, Montana, New Mexico and Washington. No conclusions can be made at this time as to why determinations on applicability have not been made for the units in these States.

Because of the ambiguity inherent in the CWA §316(b) status codes provided in the EEI Power Statistics Database, it is not possible to draw strong conclusions about the information at this time. It is recommended that additional data, to both verify and better define the information, be collected in subsequent studies. Verification may be performed by

organizing the status information on a facility-specific basis within each State that can then be subsequently verified with State representatives. Improved definitions of the status could be obtained through review of the survey tools and procedures used.

* * *

Table 11-1: Partial List of CWIS, Ecosystem, and Species Characteristics Influencing Potential for I&E

CWIS Characteristics*	Ecosystem and Species Characteristics
Location ➢ Depth of intake ➢ Distance from shoreline ➢ Proximity of intake withdrawal and discharge ➢ Proximity to other industrial discharges or water withdrawals ➢ Proximity to an area of biological concern Design ➢ Type of intake structure (size, shape, configuration, orientation) ➢ Design intake velocity ➢ Presence/absence of intake control and fish protection technologies	**Ecosystem Characteristics (abiotic environment)** ➢ Source waterbody type ➢ Water temperatures ➢ Ambient light conditions ➢ Salinity levels ➢ Dissolved oxygen levels ➢ Tides/currents ➢ Direction and rate of ambient flows **Species Characteristics (physiology, behavior, life history)** ➢ Density in zone of influence of CWIS ➢ Spatial and temporal distributions (e.g., daily, seasonal, annual migrations)

- Intake Screen Systems
- Passive Intake Systems
- Fish Diversion/Avoidance Systems
- Water temperature in cooling system
- Temperature change during entrainment
- Duration of entrainment
- Use of intake biocides and ice removal technologies
- Scheduling of timing, duration, frequency, and quantity of water withdrawal.

Construction

- Mortality of aquatic organisms
- Displacement of aquatic organizims
- Destruction of habitat (e.g., burial of eggs deposited in stream beds, increased turbidity of water column)

- Habitat preferences (e.g., depth, substrate)
- Ability to detect and avoid intake currents
- Swimming speeds
- Mobility
- Body size
- Age/developmental stage
- Physiological tolerances (e.g., temperature, salinity, dissolved oxygen)
- Feeding habits
- Reproductive strategy
- Mode of egg and larval dispersal
- Generation time

Capacity	
➢ Type of withdrawal — once through vs. recycled (cooling water volume and volume per unit time) ➢ Ratio of cooling water intake flow to source water flow	

*All of these CWIS characteristics can potentially be controlled to minimize adverse environmental impacts (I&E) of new facilities.

[Graphic omitted]

State of New Jersey
Department of Environmental Protection
Environmental Regulation
P.O. Box 423, Trenton, NJ 08625-423
FAX: (609) 777-1330

Christine Todd Whitman
Governor

Robert C. Shinn, Jr.
Commissioner

November 9, 2000

Cooling Water Intake Structures (New Facilities)
Proposed Rule Comment Clerk—W-00-03
Water Docket, Room EB 57
401 M Street, SW
Washington, DC 20460

Dear Sir or Madam:

The New Jersey Department of Environmental Protection (hereafter "the Department") appreciates the opportunity to provide comments to the United States Environmental Protection Agency (hereafter "EPA" or "the Agency") on the above referenced rule proposal. The Department has included comments on the language proposed in the preamble. In an effort to promote clarity, the Department has referenced either the section name and page number and/or reiterated a portion of the preamble language. The Department's comments are as follows:

Section V. Scope and Applicability of the Proposed Rule, Sections A-E

Comment 1 - Clear Applicability (pages 49066 - 49069)

The Department supports the language and definitions (i.e. "New Facility", "Cooling Water Intake Structure") described in items A-E of this section as well as in proposed Sec. 125.81. It is imperative that the applicability of Section 316(b) be unambiguous and straightforward to ensure that State agencies can utilize their resources focusing as to how to minimize impingement and entrainment as opposed to debating as to when Section 316(b) applies. The Department does not support continuation of the approach adopted in the 1977 draft guidance which was based on the judgement that "[t]he decision as to best technology available for intake design location, construction and capacity must be made on a case-by-case basis."

In Section A entitled "Who is Covered Under This Proposed Rule", the following criteria is stated:

- Your facility is a new facility;
- Your new facility's has a cooling water intake structure or structures;
- Your new facility's cooling water intake structure(s) withdraw(s) water from waters of the U.S. and at least twenty-five percent of the water withdrawn is used for contact or noncontact cooling purposes;

- Your new facility has a design intake flow of greater than two (2) million gallons per day (MGD); and
- Your new facility has an NPDES permit or is required to obtain one.

The Department supports these specific criteria and finds them reasonable in ensuring that new facilities that are likely to have an impact will be addressed.

Comment 2 - Consideration of Reuse/Recycling

The Department notes that on page 49067 the following is stated:

> The Agency also invites comment on an alternative where the Agency would define a cooling water intake structure to include intake structures if a facility uses five percent or more of the water drawn through the structure for cooling purposes. This alternative would further ensure that almost all cooling water withdrawn from waters of the U.S. is addressed by the requirements of this national regulation. This alternative almost might minimize any potential that the proposed 25 percent threshold would discourage recycling of cooling water, or reuse of cooling water for process needs, by facilities that recycle or reuse cooling water at rates above 25 percent, and might choose to reduced their recycling/reuse rates to avoid meeting the requirements of the proposed rule. For similar reasons, the

> Agency is considering alternative definitions for a cooling water intake structure based on whether 20 percent, 15 percent, or 10 percent of the intake flow drawn through the structure used for cooling.

The Department supports reuse and recycling of cooling water; however, is concerned that proposing an alternate percentage based on these concerns will complicate the initial issue. As a result, the Department suggests that the definitive threshold of 25% be maintained in final rule and that reuse/recycling alternatives (along with any alternative withdrawal percentages) be treated on a site-specific basis where language be included in final rule stating such.

Comment 3 - Consideration of Alternative Flow Thresholds

On page 49067 the following is stated, "In addition to a two MGD flow threshold, the Agency is considering higher flow thresholds including 5, 10, 15, 20, 25 and 30 MGD."

As stated in the previous comment, the Department feels 2 MGD is a reasonable value.

Comment 4 - Flow Threshold for Smaller Waterbodies

On page 49068 the following is stated:

> In addition to the MGD flow threshold discussed above, EPA is considering whether it should add a flow threshold to address the

> potential for adverse environmental impact posed by facilities that withdraw less than 2 million gallons of water per day but are located on small water bodies. To provide an additional measure of protection for these water bodies, the Agency might also include facilities that withdraw less than 2 MGD in this rulemaking if they withdraw more than 1% of the mean annual flow of a freshwater river or stream; the mean annual volume of a lake or reservoir; or the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level for an estuary or tidal river.

The Department supports this addition and feels that it will aid in applying section 316(b).

Comment 5 - Supply of Intake Water to Other Users

On page 49069, the following is stated regarding a situation where one facility might take in cooling water and then transfer it to other new facilities prior to discharge to waters of the United States:

> In addition, as in the previous paragraph, the Agency invites comment on a scenario in which the Director would place cooling water intake requirements in the new facility's NPDES permit and in the NPDES permit of the entity that controls the intake to ensure compliance with the cooling water

> intake requirements proposed today .....Alternatively, the Director could place cooling water intake requirements only in the permit of the facility that operates the structure. This would be administratively simpler and would limit permit requirements to the facility with direct operational control of the structure. The Agency also requests comment on this approach.

In New Jersey, the Department currently regulates existing facilities where the facility with the intake structure supplies water to an adjacent facility (where the adjacent facility does not have an intake structure). In this circumstance, the Department regulates the facility who owns and operates the intake structure and does not pose Section 316(b) requirements in the facility that uses the water that comes through that intake structure. It would be difficult to regulate a facility with section 316(b) conditions if they do not own and operate the intake structure. As such, the Department recommends that EPA propose that Section 316(b) requirements be only included for the facility that owns and operates the intake structure.

Section VII., item D - What Constitutes Adverse Environmental Impact Under the Proposed Rule?

Comment 6 - Definition of Adverse Environmental Impact

On page 49074 the following is stated regarding the definition of adverse environmental impact:

> The regulatory language in today's proposed rule does not include a definition of adverse environmental impact. However, the Agency is considering promulgating each of the alternatives discussed below as part of the final regulation and, thus, each should be viewed in a regulatory context. The Agency also might ultimately decide to publish one of these alternatives in guidance that supports the final rule. EPA is also considering taking no action regarding the definition of adverse environmental impact.

The Department notes that EPA then describes four alternative definitions for adverse impact where the third alternative is described as follows:

> Under a third alternative EPA is considering, adverse environmental impact would be deemed to occur whenever aquatic organisms are impinged or entrained as a result of the operation of a cooling water intake. Under this alternative, "adverse environmental impact" could be defined as "any impingement or entrainment of aquatic organisms".

The Department strongly recommends that EPA define adverse environmental impact in its final rule. Specifically, the Department feels that this third alternative is the only practical alternative and should be adopted in final rule for Section 316(b) for new facilities. This is the same definition that the Department currently uses in applying Section 316(b) policies for existing facilities. The

Department considers the death of any fish at or through a cooling water intake to be an "adverse impact" which must be minimized under Section 316(b). This position makes sense and simplifies an already complex analysis. State Agencies and permitting authorities could engage in a debate for years as to the population measure of a given fish species, let alone many fish species. The results of biological population studies and modeling can be very subjective because it is difficult to identify, measure, and attribute the impact of each of the many variables (what's happening on a coast wide basis, or what's happening with the climate) affecting populations of each of the impacted species. Rather than engage in this kind of biological debate, time and resources would be better spent focusing on the magnitude of the impingement and entrainment losses in relation to the costs and benefits of implementing various technologies to avoid or minimize the impact. This focus is appropriate for section 316(b) which the Departments feels is a technology-driven provision.

On a similar note, on page 49075 the following is stated:

> However, EPA also request comment on adapting the section 316(a) standard for purposes of section 316(b) and defining adverse environmental impact as impacts likely to interfere with the protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife."

The Department is very much opposed to EPA adapting the section 316(a) standard for the purposes of section 316(b). As described above, the Department strongly recommends that adverse environmental impact be defined as "any impingement or entrainment of aquatic organisms" or on an individual level as opposed to a population level.

Section VIII, item A. - What is the Best Technology Available for Minimizing Adverse Environmental Impact at New Facilities?

Comment 7- Specific Language Regarding Location, Design and Capacity

On page 49076 the following is stated:

> Under the proposed rule, EPA would group water bodies into four categories: (1) freshwater rivers or screams, (2) lakes or reservoirs, (3) tidal rivers or estuaries; and (4) oceans. The agency considers location to be the most important factor in addressing adverse environmental impact caused by cooling water intake structures.

On page 49078 this implementation strategy is continued by stating:

> The design and capacity of the intake structure are important factors that affect the velocity or speed at which the water passes through the screen or other barrier at the entrance to the cooling water intake structure. Under today's proposed rule,

> minimum flow and velocity requirements would be applied based on the actual placement of the cooling water intake structure within the particular water body types. Because different water body types have different potential for adverse environmental impact, the requirements proposed to minimize adverse environmental impact would vary by water body type.

The Department agrees that location is the most important factor in minimizing impingement and entrainment issues and supports this location framework. The Department also supports the adoption of specific flow and intake velocity requirements based on the water body types as proposed in Sec. 125.84. Definitive requirements are essential in enabling permitting authorities to guide new facilities as to what intake technologies should be used at their facilities to minimize impingement and entrainment impacts.

Specific guidelines, as included in the proposed rule, would be a great improvement over the historical case-by-case approach. The Department does not recommend continuation of implementing section 316(b) on a case-by-case, site specific basis as suggested on page 49082.

Comment 8 - Dry-Cooling as a Technology

On page 49081, the following is stated regarding dry-cooling:

> For example, for the types and sizes of facilities in areas where dry cooling has been employed at facilities in operation, permitted, or slated for construction, the Agency might determine that dry cooling is the best technology available to minimize adverse environmental impact. EPA also invites comment on regulatory approaches of this type based on hybrid wet-dry cooling rather than dry cooling.

Clearly any technology, such as dry-cooling, that requires a zero-intake flow (or nearly zero, extremely low-flow) requirement is the best technology to minimize impingement and entrainment. Given this fact, the Department suggests that the Agency definitively state that dry-cooling is considered to be the best technology where feasible. Even if dry-cooling is not feasible at all locations, a statement that dry-cooling is best technology may encourage facilities to design new facilities with dry-cooling systems. The Agency should also be clear as to what environmental studies, if any, would be required if a dry-cooling system is installed. If studies are not required under a dry-cooling system, this should be clearly stated as it may be an incentive for new facilities to adopt this technology. Advocacy of this technology over other technologies may aid in advancing the technology and, eventual installment of such, would surely minimize impingement/entrainment impacts.

Comment 9 - Tiered Approach to Adverse Environmental Impact

On page 49082 the following is stated:

> Some stakeholders have suggested an alternative regulatory framework in which section 316(b) implementation is accomplished through site-specific examination of the risk of adverse environmental impact and (assuming the cooling water intake poses some reasonable risk of adverse environmental impact) site-specific evaluation of potential BTA technologies. Under one approach, the framework of the site-specific alternative would consist of three tiers. In Tiers 1 and 2, the facility, in consultation with the Director, would assess the potential for risk of adverse environmental impact associated with the proposed cooling water intake structure. Tier 1 would be both a screening and an assessment tier that relies on existing information that is site-specific or relevant to the adverse environmental impact determination. Tier 2 would focus on collection and analysis of additional information collection activities, as necessary, to make the adverse environmental impact determination. In Tier 3, which would assume that the Director has found that the cooling water intake structure is reasonably likely to pose risk of adverse environmental impact, the facility would assess BTA

alternatives, including an evaluation of costs and benefits.

As discussed in a previous comment, the Department strongly recommends that the agency define adverse environmental impact in final rule as occurring whenever there are any impingement and/or entrainment effects. Given the above discussion, this position greatly simplifies this very complex three tiered analysis. In adopting such a position and considering the above discussion, the permitting agency could skip right to Tier 3 and focus its efforts on available technologies rather than debating about the very subjective determination of adverse environmental impact. This suggested technology-based approach would allow the permitting authority to consider the most protective technology to minimize impacts and compare the cost of the option to the environmental benefits which will be gained by its implementation. If the cost of the most protective option is not wholly disproportionate to the expected environmental benefits, then that option is required under the permit as BTA. But if the cost of minimization is considerable (wholly disproportionate) to the expected benefits, it is rejected and the same analysis is then applied to the next protective option. This process would continue until there is an option that can be required at a cost that is reasonable compared to the level of minimization to be expected. Agencies could spend years in circuitous debate on Tiers 1 and 2.

VIII.3.d. Flow Requirements for New Facilities With Cooling Water Intake Structures Located in Estuaries and Tidal Rivers or the Littoral Zone in Other Water Body Types

Comment 10 - Wet-Cooling, Closed-Cycle Recirculating System

On page 49087, the following is stated:

> Today's proposal would require that the intake flow withdrawn by a cooling water intake structure be reduced to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system by all cooling water intake structures at the facility.....In addition, EPA cost estimates show that this requirement is available to new facilities on a national level.

Given that closed-cycle cooling is an available technology, the Department suggests that the Agency mandate this specific technology by calling it "best technology available" for facilities that will be located in estuaries and tidal rivers of the Littoral Zone. Additional technologies may need to be applied at the intake to ensure that impingement and entrainment is minimized to the best extent practicable. The Agency should also be clear as to what environmental studies, would be required if a closed-cycle cooling system is installed. If studies are either not required or a lesser amount is required for a wet closed-cycle cooling system, this should be clearly stated. A lesser amount or lesser

amount of complexity for scientific studies may be an incentive for new facilities to adopt this technology. If wet closed-cycle cooling systems are considered infeasible or the costs are wholly disproportionate to the benefits based on site-specific considerations, the facility would bear the burden of proof for alternate intake protection technologies.

VIII.A.6. What is the Role of Restoration Measures?

Comment 11 - Restoration Measures

On page 49089 the following is stated:

> Given the limits on the ability of direct control technologies (location, flow, velocity, and other requirements) to eliminate environmental harm in all circumstances, EPA is considering a variety of mandatory, discretionary and voluntary regulatory approaches involving restoration measures. On the other hand, EPA also is considering specifying that restoration measures may not be part of a Section 316(b) determination. EPA invites comment on the appropriate role of restoration, i[f] any, under section 316(b).

First and foremost, the Department considers Section 316(b) to be a technology driven provision. Any technology for which the costs are not wholly disproportionate to the benefits must be required for new cooling water intake structures. As described previously, the Department recommends that final 316(b) rule include language to state that

dry-cooling closed-cycle recirculating systems are the first choice to minimize impingement/ entrainment impacts thereby being the best technology. As a second choice, the Department recommends that language be included in the final rule stating that wet cooling closed-cycle recirculating systems are the best technology available since they are an available technology that is effective in minimizing intake water flows and hence impingement/entrainment impacts. The cooling water intake structures for facilities with wet-cooling closed-cycle recirculating systems must still be equipped with technology to minimize impingement/entrainment to the best extent practicable.

In the event that dry-cooling closed-cycle recirculating systems are not feasible and wet-cooling closed-cycle cooling recirculating systems are installed, the Department supports mitigation measures to further mitigate impingement/ entrainment losses. There is no debate that wetlands aid in producing fish and therefore help mitigate the effects of a facility's impingement and entrainment numbers. This is especially important since shrinking open space and lost wetlands have become a critical environmental issue. The Department supports the inclusion of restoration measures as part of section 316(b) rules. However, this support is conditional on the premise that all technological options are carefully considered first and mitigation shall not be required as a substitute for technology.

Given the previous recommendation by the Department that cooling towers should be recognized as best technology available, the Department suggests that language be included in final rule to state that mitigation measures are mandatory if it is determined that cooling towers can not be installed for whatever site-specific reasons. The Department also suggests that language be included in the final rule to state that mitigation measures are always encouraged and recognized as reducing impingement/entrainment impacts on a waterbody for the purposes of section 316(b). If a permitting agency determines that mitigation measures will be part of the section 316(b) determination, these measures must be specifically required in that facility's NPDES permit.

VIII.A.7. Additional and Alternative BTA Requirements

Comment 12 - Timing Issues for Alternate BTA Requirements

On page 49091 the following is stated:

> Proposed Sec. 125.85 would allow the Director, in the permit development process, to set alternative BTA requirements that are less stringent than the nationally applicable requirements..... Proposed Sec. 125.85(a)(2) provides that alternative requirements that are less stringent than the requirements of Sec. 125.84 would be approved only if compliance with the

> requirement at issue would result in compliance costs wholly out of proportion to the costs considered during development of the requirement at issue, the request is made in accordance with 40 CFR part 124, the alternative requirement requested is no less stringent than necessary, and the alternative requirement will ensure compliance with sections 208(e) and 301(b)(1)(C) of the Clean Water Act.

The Department appreciates that flexibility is being given to the permitting authorities as discussed in this proposed section. However, it is critical that the timing element be also addressed in this section. If a facility has determined that the conditions in Sec. 125.84 can not be met and the facility seeks approval under this alternate language in Sec. 125.85, it is critical that the facility consult with the permitting agency and submit a demonstration as to why the conditions in Sec. 125.84 can not be met. If this demonstration is accepted by the permitting authority, a pre-determination can be issued and the facility can move on to completing the requirements described in Sec. 125.85. This will enable the permitting authority to render a decision regarding the feasibility of approval under Sec. 125.85 before extensive time and resources are committed by the facility, in designing and completing the requirements in Sec. 125.86, as well as before extensive review time and resources are committed by the permitting authority.

C. How is Cost Being Considered in Establishing BTA for New Facilities?

Comment 13 - Use of Wholly Disproportionate Cost Test

On page 49094 the following is stated:

> Under the wholly disproportionate cost test, a cooling water intake structure technology would not be deemed to reflect BTA if the incremental cost of requiring the use of that technology are wholly disproportionate to the environmental benefits to be gained through its use. Several section 316(b) administrative decisions have stated that this test is the most appropriate for determining economic burden.

The Department currently uses the wholly disproportionate test in applying section 316(b) to its existing facilities and supports the use of this useful test. However, the Department strongly recommends that EPA offer some guidance as to its intent regarding the term "wholly disproportionate" where a specific ratio or range of ratios should be defined. In the Department's experience, industries view "wholly disproportionate" as meaning a ratio of 1:1 costs versus benefits where, if costs do not equal benefits, the technology does not pass the test. Clearly, the Department does not agree that 1:1 is "wholly disproportionate". Additional guidance on this term is essential.

IX. Implementation

Comment 14 - Clear Implementation Requirements

On page 49096 the following is stated:

> Under the proposed rule, section 316(b) requirements would be implemented in an NPDES permit. The regulations would establish application, monitoring, recordkeeping, and reporting requirements for new facilities. The proposed rule would also include requirements for Directors in developing NPDES permits for new facilities. The proposed rule states that the Director, at a minimum, must include in the permit the cooling water intake structure requirements at Sec. 125.84, monitoring conditions at Sec. 125.87, and recordkeeping and reporting requirements at Sec. 125.88.

The Department supports the clear language included in the preamble as well as in the proposed sections. This information will be very helpful in guiding permitting authorities as well as applicants in implementing section 316(b) for new facilities.

Again, the Department appreciates the opportunity to provide comments. Please feel free to contact Chief Debra Hammond of the Bureau of Point Source Permitting at (609) 292-4860 if you should have any questions regarding this letter.

Sincerely,

/s/ Dennis Hart

Dennis Hart
Assistant Commissioner
Environmental Regulation

Comment ID – 316bNFR.206.014

Subject Matter Code	**10.11**
Request for Comment: Dry Cooling -- Proposed Option	

Author Name	David K. Gordon & Reed W. Super
Organization	Riverkeeper, et al.

Dry Cooling Installations Are Economically Affordable, Beneficial And Are Increasingly-Frequent.

As noted, the Clean Water Act affords compliance costs a minor role, if any, in the determination of best technology available for minimizing adverse environmental impact from new sources. More importantly, the incremental costs of installing and operating dry cooling systems are relatively insignificant in the context of the electric generating industry's overall capital costs, revenues and profits. In any event, the incremental costs pale in comparison to the vast benefit to aquatic and marine resources which dry cooling provides. Moreover, dry cooling may provide environmental benefits beyond the huge avoidance of impact to aquatic and marine ecosystems, and may provide other economic benefits to the power industry.

Tellus conducted a comparative economic assessment of the costs of a zero intake rule compared

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to the other options in order to determine whether dry cooling is cost-effective. EPA estimated that the total annualized cost of a national dry cooling requirement would be $193 million, and electric generators would incur $187.2 million of that total. Applying the Proposed Regulation's "compliance cost/revenue test," the Tellus Report demonstrates that the capital cost and operations and maintenance costs of air-cooled structures at combined-cycle electric generating plants represents a small fraction, only 2-3%, of the estimated annual revenues for those facilities. <FN 82>

Even despite somewhat higher incremental costs for dry cooling, other factors often compensate for or offset such costs, or even provide a net economic benefit for industry as well as the public. As a result, as explained below and more fully in the Tellus Report, dry cooling installations at electric power plants are increasingly common and growing rapidly. First, because newer combined-cycle plants need cooling only for the steam portion of their cycle (only about a third of their total capacity), they can be cooled with a much smaller dry cooling system than a comparably sized, steam-only generating plant. Thus the increased cost for dry cooling is considerably smaller than it would have otherwise been for conventional steam plants. In fact, dry cooling costs at today's combined cycle facilities are roughly equivalent to the costs for installing a wet system at a conventional steam facility. <FN 83>

Moreover, rising populations, urban sprawl, and economic growth in arid parts of the country have put ever greater strains on U.S. aquatic and marine resources. In many areas regulators and the public are

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[Footer omitted in printing.]

growing increasingly intolerant of irresponsible water use, especially at the prodigious amounts consumed by power plants. Indeed, the emphasis in many states in recent years has been on "zero-discharge" facilities. As a result, dry cooling often streamlines the permitting process for all parties by avoiding controversial and complex assessment of ecosystem damage and mitigation strategies. Such sensitivity to water concerns years ago led European regulators to pioneer the use of dry cooling. <FN 84>

In some climates, dry cooling systems for some facilities may be 1%-2% less efficient in cooling power plant condensers, resulting in corresponding increases in costs (referred to as an "energy penalty"). However, dry cooling facilitates an increase in energy transmission efficiency because the minimal water consumption needs of air-cooled facilities allow them to be located much closer to consumers than wet-cooled facilities which are required to locate on major water bodies. The increased siting flexibility afforded by dry cooling increases efficiency and decreases transmission losses, thus yielding a net efficiency gain throughout the entire generation-to-consumption system. <FN 85> In any event, energy conservation measures can more than offset any potential minor loss of efficiency from dry cooling.<FN 86> Moreover, in cold climates, where ambient air temperatures are often significantly below 40 degrees F, dry cooling systems can actually be more efficient at removing heat than a comparable wet-cooling system. In such cases, less fuel is needed to produce an equivalent amount of energy, thereby reducing both costs and air emissions and affording an "energy bonus." <FN 87>

[Footer omitted in printing.]

Any net efficiency losses that might result from the use of dry cooling must be viewed in the context of overall system-wide efficiency. The potential 1.5% dry cooling energy loss is very small compared with other typical system-wide efficiency losses. A typical steam electric generator is only 30 to 40% energy efficient; two-thirds of the heat from fuel combustion in a typical steam electric generator is simply wasted.<FN 88> The most advanced new combined cycle turbines are capable of efficiencies as high as 60%. New cogeneration plants are often as high as 80 to 90 % energy-efficient because the exhaust heat can be put to use which avoids other fuel combustion elsewhere. Thus, the building of modern generating facilities with dry cooling systems provides significant efficiency gains which dwarfs any potential loss due to the cooling system design.<FN 89>

Applicants are quick to accept dry cooling, despite earlier misgivings, when regulators require it to preserve aquatic ecosystems and other natural resources. For example, PG&E Generating Co., after opposing dry cooling due to cost concerns, readily accepted a dry cooling-equivalent capacity permit condition set by the New York State Department of Environmental Conservation for its proposed plant at Athens, on the Hudson River. Shortly after the DEC ruling the PG&E director of government relations summarized the company's position: "We're not challenging any of the conditions. We're going to accept it. Glad to have it." <FN 90>

The practicability of dry cooling is further reflected in its increasingly common use. Though dry cooling systems still represent just a small fraction of the total

market for power plant cooling, installations of dry cooling technology in the U.S. have been growing rapidly since the early 1980s. Approximately 27 percent of new capacity since 1985 has used dry cooling.

At present there are over 600 electric power plants throughout the world using dry cooling technology, including at least 50 in the U.S. representing nearly 6000 MW of generating capacity.<FN 91> Further, an additional 4600 MW of air-cooled capacity are currently under construction and due online by 2002, not counting additional capacity cooled by hybrid wet/dry cooling systems. Canada and Mexico together have at least 7 air-cooled power plants, representing roughly 1000 MW of online capacity. The world's largest air-cooled power plant is the 4000 MW Matimba Generating Station in South Africa, which-as a nation has over 10,000 MW of electric generating capacity online today using dry cooling systems.

Dry cooling is a demonstrated, available, proven, effective, reliable and affordable cooling technology, the use of which is rapidly increasing in the U.S. and world-wide. Because dry cooling systems are the best technology available for minimizing the adverse environmental impact of cooling water intake structures, they must be required for all new facilities under the Phase I regulation.

Footnotes

82. Tellus Report, at pp. 14-16. Despite assembling some evidence suggesting that the capital cost and operations and maintenance costs of air-cooled

structures are lower than suggested by EPA, Tellus nevertheless used the EPA values in its calculations.

83. Id. at p. 16.

84. Id. at p. 17.

85. Id. at p. 7. Electric transmission line losses lines are generally between S and percent system-wide for most electric grids.

86. Id. at p. 8. Nearly as much fuel is wasted by end-users of electric power as by electric generators. Typical office buildings in the U.S. waste about two-thirds of the energy it consumes each year. Thus, any losses in energy efficiency any associated with dry cooling could easily be recouped through targeted demand side management (i.e., conservation) measures.

87. Id. at p. 7.

88. Id. at p. 8, citing Kaarsberg (1999).

89. Id. at p. 8. Indeed, EPA has issued Clean Air Act regulations for the electric industry that caused similar efficiency penalties in order to reduce the air pollutants NOx and SO2.

90. Albany Times-Union, July 15, 2000.

91. EPA's preamble erroneously states that there are only 60 dry-cooled facilities world-wide. 65 Fed. Reg. at 49081.

EPA Response

EPA disagrees with the factual statements and arguments made by the commenter. Each issue is responded to below.

EPA disagrees that the "CWA affords compliance costs a minor role, if any, in the determination of best technology available for minimizing adverse

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environmental impact from new sources." EPA does not believe that section 316(b) of the CWA precludes EPA from considering cost. This interpretation is supported by section 316(b)'s cross references to sections 301 and 306 of the CWA which may reasonably be interpreted to mean that Congress intended EPA to control intake when it controlled discharges under the same technology-based standard. It is inconsistent for the commenter to advocate EPA to interpret the references to 301 and 306 to support a technology-based approach to the rule but then to advocate that EPA may not consider the factors listed in sections 304(BAT) or 306 (NSPS) in determining "best technology available for minimizing adverse environmental impact" under CWA section 316(b). Moreover, this interpretation is supported by the similarity of the statutory standards in section 316(b)("best technology available for minimizing adverse environmental impact") to the statutory standards in sections 301, 304, and 306 of the CWA. C.I.R. v. Lundy, 516 U.S. 235 (1996)(It is a normal rule of statutory construction that identical words used in different part of the same act are intended to have the same meaning.) Section 306(b)(1)(B), governing new source performance standards for new sources, specifically states that in establishing "best available demonstrated control technology," the Administrator shall take into consideration "the cost of achieving such effluent reduction." Sections 301 and 304 which require EPA to establish effluent limitations guidelines for existing facilities that reflect "best available technology" or "best available technology economically achievable," "best conventional technology" and "best

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practicable technology" all provide that cost may be considered to some degree. For example, in considering "best available technology," the statute provides EPA shall consider "the cost of achieving such effluent reduction." See CWA section 304(b)(2)(B). Several courts (as well as the EPA Administrator in a number of formal adjudications cited below) have stated that cost is an appropriate factor under section 316(b). In Seacoast Anti-Pollution League v. Costle, 597 F.2d 306, 311 (1st Cir. 1979), the Court stated "[t]he legislative history clearly makes cost an acceptable consideration in determining whether the intake design reflect[s] the best technology available." In United States Steel Corp. v. Train, 556 F.2d 822, 850 (7th Cir. 1977), the Court in finding section 308 conferred sufficient authority for requiring monitoring of cooling water intake structures independent of a cost benefit analysis, said, " ... we trust that EPA will conduct a limited cost-benefit analysis once the information on which an evaluation of the various technologies can be made becomes available." Hudson Riverkeeper Fund, Inc. v. Orange Rockland Util., Inc., 835 F. Supp. 160, 165-66 (S.D.N.Y. 1993). For these reasons, EPA believes it reasonable to interpret the unique phrase "best technology available for minimizing adverse environmental impact" in a manner that allows EPA to consider cost.

Precisely how to consider cost in the context of the 316(b) rule for new facilities has been a matter of some dispute. EPA has long stated that neither the statute nor the legislative history requires a formal or informal cost-benefit assessment. 41 Fed. Reg. 17,387 (April 26, 1976). The 1976 preamble also stated that the term

"best technology available" should be interpreted as best technology available at an economically practicable cost." See 118 CONG. REC 33,762 (1972), reprinted in 1 Legislative History of the Water Pollution Control Act Amendments of 1972, at 264 (1973)(Statement of Representative Don H. Clausen.).

Historically, the EPA Administrator has addressed this issue in the context of several formal adjudications in which he determined that no formal cost benefit balancing was required but that costs could be considered if wholly disproportionate to the environmental benefit. See In the Matter of Public Service Company of New Hampshire, et al., (Seabrook Station Units 1 and 2) NPDES Case No. 76-7 (NPDES Permit Application No. NH 0020338; 1977 NPDES LEXIS 6 (June 10, 1977), where the Administrator overturned the decision of the Regional Administrator who at the time, advocated that section 316(b) required cost/benefit balancing. The Administrator held that "there is nothing in section 316(b) indicating that a cost/benefit analysis should be done." At the same time, the Administrator stated that "I do not believe it is reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." See also Decision of the General Counsel, No. 63 In re Central Hudson Gas and Electric Corp., (July 29, 1977). This "wholly disproportionate" test has also been applied in the effluent guidelines program with respect to the first stage of technology controls, "best practicable technology." See Rybachek v. EPA, 904 F.2d 1276 (9th Cir. 1990); CMA v. EPA, 870 F.2d 177 (5th Cir. 1989);

Association of Pacific Fisheries, 615 F.2d 794 (9th Cir 1980).

In this rule for new facilities, after notice and comment rulemaking, EPA has adopted an approach to considering costs that is analogous to how costs are considered in establishing new source performance standards for new sources "best available demonstrated control technology", and for effluent limitations guidelines for existing sources under the second (1983) level of control for certain pollutants, "best available technology." As stated in the preamble to the proposed rule, this position reflects congressional concern that the application of best technology available should not impose an impracticable and unbearable economic burden. 65 Fed. Reg. 49094 (August 10, 2000). EPA believes this approach is appropriate for new facilities. Thus at proposal, and in this final rule governing new facility cooling water intake structures, EPA has examined cost to revenue ratios and potential barriers to entry in a manner analogous to how it looks at economic achievability for certain effluent limitations guidelines and all new source performance standards. As a supplementary analysis, EPA has found it reasonable to consider the incremental effectiveness (in terms of reductions in impingement and entrainment) as compared to the incremental cost of various technologies. EPA believes that the unique phrase "minimizing adverse environmental impact" in CWA section 316(b) supports an interpretation that considers the practicability and reasonableness of incrementally stringent measures, including, among other things, economic considerations. This is consistent with

several decisions interpreting the role of costs under BAT effluent limitations guidelines. For example, in American Petroleum Institute v. E.P.A., 787 F.2d 965, 972 (5th Cir. 1986), the court upheld certain controls on trace amounts of mercury and cadmium because the costs of the limitations would not be significant. At the same time, the Court stated, "Indeed, EPA would disserve its mandate were it to tilt at windmills by imposing BAT limitations which removed de minimis amounts of polluting agents from out nation's waters, while imposing possibly disabling costs upon the regulated industry." This approach is analogous to EPA's decision not to require controls based on dry cooling, as discussed in the preamble to the final rule.

EPA disagrees that the incremental costs of installing and operating dry cooling systems are relatively insignificant in the context of the electric generating industry's overall capital costs, revenues, and profits.

EPA's economic analysis of the dry cooling alternative for the final rule demonstrates that all 83 power plants will experience cost to revenue impacts greater than 4% for a zero or near-zero intake requirement. Twelve plants will experience cost to revenue impacts greater than 10%. As such, EPA challenges assertions that the incremental costs of dry cooling systems are insignificant in any context.

As discussed in the notice of data availability EPA has estimated compliance costs of a dry cooling including the replacement power costs of the energy penalty. See response to comment 316bNFR.068.332 and 66 FR 28066. In addition, the number of new power plants projected within the scope of the rule has

increased since proposal. See the preamble to the final rule. As such, the costs quoted by the commenter regarding the proposal estimates of the dry cooling option have changed significantly. The final rule analysis, which includes the contribution of the energy penalty to the recurring annual costs, projects that the total annualized cost for the dry cooling alternative is $490 million (in 2000 dollars). EPA notes that the vast majority of costs associated with this option are incurred at the 83 power plants, and not at the 38 manufacturers. Because dry cooling is not a feasible option for all manufacturing facilities (see response to comment 316bNFR.028.022 and section V.C-4 of the preamble to the final rule), EPA only applied costs of recirculating wet cooling towers to these types of facilities. Therefore, of the $490 million dollars in annualized cost for the dry cooling option, the 83 power plants accept the most sizable burden. The cost to revenue impacts of this regulatory option, as noted above, would far exceed the values estimated by the commenter. For direct comparison, the average cost to revenue per power plant would be greater that 4.0% for all power plants. EPA considers this level of cost to revenue impacts to be significant. In comparison, the cost to revenue impacts of the final rule, which is based in part on flow reduction commensurate with that achieved using recirculating closed-cycle wet cooling, do not exceed 3.0 percent for a single facility, and the vast majority of the impacts are below 1.0 percent.

The statement made by the commenter about the reduced need for steam condensation at combined-cycle power plants is supportive of the points EPA has made regarding the true size of the dry cooling installations

at what the commenter deems large demonstrated cases. (See response to comment 316bNFR.206.013 for further discussion.)

EPA disagrees that dry cooling costs at today's combined-cycle facilities "are roughly equivalent to the costs for installing a wet system at a conventional coal-fired facility." This assertion is misleading and untrue. A comparison of capital costs between equally sized combined-cycle plants for wet and dry cooling tower systems reveals that the dry cooling plant's capital costs would exceed those of the wet cooling tower plant by 3.3 fold. The installed wet cooling tower capital cost is approximately $9.98 million, while the dry cooling installation would cost approximately $33.4 million. For a typical, modern 700-MW combined-cycle power plant, these erected capital costs represent approximately less than 2 percent for wet cooling and approximately 7 percent for dry cooling of the total capital cost of the power plant construction project. (See "example_dry_v_wet.cost.xls" in the docket.) Hence, the erected capital costs of dry cooling systems as compared to wet cooling towers for the same sized 700-MW combined-cycle power plant are significantly more expensive and by no means "insignificant." EPA notes that this is simply the erected capital cost and does not include the operation and maintenance costs associated with these two types of cooling systems. The operation and maintenance costs of the wet cooling tower (without including the effects of energy penalties) would be $1.8 million per year, while the dry cooling system would cost $7.4 million per annum. Without incorporating energy penalties, the ratio of operation and maintenance costs of dry cooling to wet

cooling for a typical 700-MW combined-cycle power plant would be approximately 4 to 1. After factoring in the recurring costs of energy penalties at the two plants, the recurring annual costs increase to approximately $2.3 million for the wet tower plant and $10 million for the dry cooling plant. This corresponds to a dry to wet ratio greater than 4 to 1. The total annualized costs of these systems are estimated at $3 million for the wet cooling tower system and $13 million for the dry cooling system (a ratio of greater than 4 to 1).

EPA estimates that the capital cost of a wet cooling tower installation at a 700-MW coal-fired plant (i.e., of the same capacity as the combined-cycle plant described in the preceding paragraph), the total erected capital cost of a cooling tower system would be approximately $15.5 million. This shows that the commenter is incorrect in claiming that comparative costs of coal-fired plants with wet towers to those of dry cooled combined-cycle plants of equal capacity (in megawatts) are "roughly equivalent." The ratio of erected capital costs for dry cooling at a typical 700-MW combined-cycle plant to wet towers at a typical 700-MW coal-fired plant is 2.2. Similar ratios are seen for operation and maintenance costs, energy penalty costs, and total annualized costs. EPA disagrees that this is even a reasonable comparison, but includes the results as evidence that the commenter's statements are without factual basis.

EPA notes that in the commenter's footnote 82, the reference states, "despite assembling some evidence suggesting that the capital cost and operations and maintenance costs of air-cooled structures are lower

than suggested by EPA, Tellus nevertheless used the EPA values in its calculations." EPA points out that the referenced report provides no evidence of this claim and provides no data to counter EPA's estimates.

With respect to the commenter's statement regarding the abundance of dry cooling applications, EPA questions the basis for the statement that "the emphasis in many states in recent years has been on 'zero discharge' facilities." The commenter does not expand on the types of "facilities" they mean. By inference EPA must assume that the commenter implies power plant facilities. If this is the case, then the commenter exaggerates trends in production of dry cooling versus wet cooling for recent power plant projects. As pointed out in comment 316bNFR.525.204, in the 1995 to 1999 five-year period, approximately 380 MW of new power plants were constructed with dry cooling (corresponding to a 2.5 percent growth in dry cooling usage). During this same period, over 10,000 MW of new growth with wet cooling came on-line (a 1.2 percent growth in wet cooling usage). To EPA, this data does not imply that the emphasis in many states in recent years has been on zero-discharge power plants.

With respect to European political motivations for development of policies concerning water usage, EPA believes that it is nevertheless appropriate for the U.S. to balance factors relevant here as articulated in the preamble to the final rule.

EPA agrees that in select climates, and for select types of facilities, dry cooling systems are 1 to 2 percent less efficient in cooling of plant condensers than wet cooling systems. EPA adds that this is true

only for combined-cycle plants, where the mean annual energy penalty (averaged across climates) is 2.1 percent for dry cooling compared to once-through systems. However, for many other cases, the energy penalty is dramatically higher for dry cooling compared to either once-through or wet cooling towers. For instance, southern climates see a significant energy penalty, and coal-fired plants show mean annual penalties (averaged across climates) of 8.6 percent. In addition, the peak summer shortfalls during hot periods can be debilitating. These shortfalls range from 2.4 percent in the best case to 12.3 percent in the worst. See Chapter 3 of the Technical Development Document.

EPA disagrees that energy transmission efficiencies should factor into a consideration of the relative efficiency of any cooling system, let alone for future power plants whose siting will be influenced by many factors outside the scope of this rule. First, there is no information provided by the commenter, nor any reason given, to view a regulatory option based on dry cooling as to encourage location of plants closer to consumers. Considering that land costs are generally more expensive near and in urban areas, and that the dry cooling systems require significantly more land than comparably sized wet systems, the commenter's assertions are without merit, nor do they address the issue of public opposition to power plant construction. Second, electricity is delivered to a grid, which then delivers power to consumers. This is especially true today with the advent of deregulated markets. As pointed out in footnote 85 to the comment, the transmission losses are assigned to the grid, as a whole,

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not individual plants. Therefore, the loss of electricity for plants supplying to a grid, which then delivers to consumers (often over long distances) would be the same for power plants located nearby or great distances from the end consumer. Even if the distance between generator and consumer is appreciably shortened, which EPA views as a misconception, the necessary voltage step-up at the plant, the voltage step-down at the distribution station, and a further voltage step-down for the consumer represent fixed losses that are independent of the distance the electricity moves.

In addition, EPA contends that the efficiency losses (i.e., energy penalties) of an alternative based on dry cooling are not "minor." In fact, the 1900 MW of lost energy capacity projected for the dry cooling alternative is anything but minor, in EPA's view. The equivalent of two very large or three large power plants would need to be constructed to overcome the energy losses of the dry cooling alternative. The air emissions increases as a result of this replacement capacity, if they were to come from increased generation across the US market, would be equivalent to those of three new 800MW coal-fired power plants. Alternatively, if the replacement capacity would be new capacity exclusively, it would be dry cooling equipped plants with the associated elevated capital and annual costs and land area requirements. Therefore, EPA considers the issue of inefficiency of dry cooling, and EPA's subsequent rejection of the dry cooling alternative, to be principal to the concept of energy conservation. Considering that the State of California recently experienced shortages of demand

less than the energy penalty of the dry cooling option, the imposition of 1900 MW of mean annual energy penalty capacity loss on planned new power plants does not support the Administration's Energy Plan and associated Executive Orders.

EPA disagrees with the statement that, in cold climates, dry cooling systems can actually be more efficient at removing heat than a comparable wet-cooling system. This statement is patently false. As discussed in comments 316bNFR.524.201, 316bNFR.368.004, and 316bNFR.056.044, the practical limitations of the dry cooling system, as limited by the dry bulb temperature, which is always equal to or greater than the wet bulb temperature met by wet cooling systems, prevent its performance from exceeding that of wet cooling. Moreover, increased parasitic fan loads for dry cooling systems will ensure that the technology will not operate as efficiently as a comparable wet cooling system.

EPA disagrees that system-wide efficiency of a power plant is a relevant basis for dismissal of energy penalties. The projected power plants within the scope of this rule will primarily utilize combined-cycle designs and modern coal-fired designs, while small amounts of the new generating capacity within the scope of this rule may be in the form of cogeneration. The efficiency of the electricity production process is directly affected by the cooling system to be installed. The vast majority of projected new plants (i.e., 90 percent) would install closed-cycle recirculating cooling towers, regardless of the requirements of this rule. Therefore, EPA's technology-based performance requirements for final rule, which are based, in part, on

recirculating closed-cycle cooling would impose potential changes in cooling system designs on only nine new plants. The comparable effect on the efficiency of these plants will be small on a facility level and national basis. See Chapter 3 of the Technical Development Document. However, a regulatory alternative based on dry cooling would impose cooling system design changes on each of the 83 power plants within the scope of the final rule. Therefore, each of the 14 projected coal-fired plants would experience a mean annual energy penalty of approximately 8.6 percent. As stated by the commenter, the typical steam electric generator (such as these coal-fired plants) would, at peak operation, operate at approximately 40 percent efficiency. The energy penalty of nearly 9 percent is very significant when compared to the system-wide energy efficiency of this type of power plant. Additionally, each of the 69 projected new combined-cycle plants would see a mean annual energy penalty of approximately 2.1 percent. With new design efficiencies of 60 percent, at peak operating efficiency, a 2.1 percent energy penalty is less striking than in the coal-fired cases. However, the cumulative effect for all 69 power plants is significant. EPA views energy loss as a more serious matter than the commenter, and disagrees that improvements in energy efficiency of modern plants would "dwarf" losses through the dry cooling systems.

Furthermore, EPA seeks to encourage replacement of older facilities with new combined-cycle facilities. By basing the requirements of the rule on dry cooling, EPA would create a disincentive to replacement of an older existing facility with a new facility due to a

significant increase in annualized costs. Instead, generators would have an incentive to modify existing plants in a manner that would prevent them from being controlled by this rule.

The quotation from the director of PG&E is interesting, but hardly an endorsement of a technology. Although EPA supports dry cooling where a facility elects to use it (it would qualify for Track I), EPA is concerned for the reasons stated in the preamble and in this response about the downsides of requiring dry cooling on a national basis.

The statement made by the commenter that "approximately 27 percent of new capacity since 1985 has used dry cooling," is not substantiated and, in EPA's view, misleading. The commenter does not state where the new capacity has been constructed. As described in substantiated comments that EPA received to the notice of data availability, in the period from 1990 to 1999 only 36 dry cooled power plants worldwide were built with capacities greater than 50 MW. Of these, only 10 were constructed in the US; only one of these 10 had a capacity greater than 200 MW. Seventy-five percent of the dry cooling systems constructed in the last decade were not in the United States. See comment 316bNFR.524.204.

[Graphic omitted] William McCracken <mccrackw@michagan.gov>
To: Claudio Ternieden/DC/USEPA/US@EPA
cc:
Subject: Re: 316(b) Burden

01/24/02 05:37 PM

I am the Chief of the Permits Section, Surface Water Quality Division, Michigan Department of Environmental Quality.

>>> <Ternieden.Claudio@epamail.epa.gov> 01/24/02 05:33PM >>>

Mr. McCracken,

What is your position title, office, etc with Michigan DEQ? We will need that for the record. Thanks again for your help and information.

CLaudio

William McCracken <mccrackw@michigan.gov>	To: Claudio Ternieden/DC/USEPA/US@EPA
01/24/02	cc: William Creal <CREALW@michigan.gov>, Daniel Dell <DELLD@michigan.gov>, Jeffrey Fischer <FISCHEJJ@michigan.gov>, James Grant <GRANTJE@michagan.gov>, David Hamilton

04:16 PM <HAMILTOD@michagan.gov>,Asad Quraishi <AURAISHA@michgan.gov>
Subject: 316(b) Burden

As we discussed, I believe there would be a considerable burden on the NPDES permitting program in Michigan if the 316(b) regulations for existing facilities require environmental effects studies at individual facilities. My experience indicates that studies of the effects of cooling water intake structures on the receiving water fisheries are extremely difficult to do and the results are difficult to interpret. The burden would be considerably reduced if the regulations require specific cooling water intake structure technology. Also, this approach would seem to me to be consistent with the intent of section 316(b).

I trust this information is helpful. Regards, Bill McCracken

Frank Ackerman, Ph.D.[1]
Global Development and
Environment Institute
Cabot Center
Tufts University
Medford MA 02155

August 1, 2002

Cooling Water Intake Structure (Existing Facilities: Phase II)
Proposed Rule Comment Clerk — W-00-32
Water Docket, Mail Code 4101
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue N.W.
Washington D.C. 20460

Re: Comments on Proposed Rule, RIN 2040-AD62
Clean Water Act §316(b) — National Pollutant Discharge Elimination System —
Proposed Regulations for Cooling Water Intake Structures at Phase II Existing Facilities, EPA ICR no. 2060.01

Dear Sir/Madam:

I am pleased to have the opportunity to submit these comments on the above-captioned rulemaking. My comments address EPA's analysis of benefits for, and the role of cost-benefit analysis in, this rulemaking proceedings. Briefly stated, EPA's analysis of the

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[1] Research Director, Global Development and Environment Institute, and Research Assistant Professor, Department of Urban and Environmental Policy and Planning, Tufts University. These comments are not being submitted in my official capacity at Tufts University. My comments are being submitted on behalf of Riverkeeper.

benefits of reduced cooling water intake is seriously incomplete, and should be considered as no more than an extreme lower bound on the complete benefits. A simple quantitative adjustment, filling in just two of the many gaps in EPA's estimate of benefits and drawing on more recent economic literature than EPA has used, results in substantially greater benefits for every option EPA is considering, and show that EPA's proposed option does not maximize net social benefits. To be sure, my adjustments remain incomplete; they do not come close to capturing all of the benefits of regulating cooling water intake structures. Nevertheless, my estimates are sufficient to demonstrate that policy options involving greater reduction in water intake create greater net benefits than the proposed option.

These comments also examine the methodological problems of valuation of the environmental benefits involved in this case. Natural ecosystems, such as the aquatic ecosystems affected by cooling water intake, provide numerous interrelated services, some of which are clearly valuable but difficult to quantify. Assigning a zero value to these benefits would misstate society's preferences and values. Yet rigid insistence on applying a single, narrowly defined valuation methodology to every benefit would, in effect, dismiss (that is, value at zero) all hard-to-quantify environmental values. For this reason, EPA's analysts should be commended for exploring valuation methodologies such as habitat-based replacement cost (HRC) and societal revealed preferences, which have the potential to address the full range of ecosystem services. The problems with these alternative

methodologies are that they do not go far enough, and cannot be consistently applied across the board.

In addressing the methodological problems, I also respond to aspects of the comments on this rule by Dr. Robert Stavins. Commenting on behalf of PG&E National Energy Group, one of the major corporations that has a direct financial interest in the outcome of this rulemaking procedure, Dr. Stavins reaches conclusions opposite to mine, arguing that all methodological innovations in benefits valuation in this case are illegitimate and that many EPA benefit estimates are drastic overestimates. Throughout his comments, he inaccurately suggests that he speaks for all economists. However, he neglects to document the supposed unanimity of economists on these issues, repeatedly offering only his own personal authority as evidence for the views of the entire profession. In my comments I describe the ongoing differences among economists, including recent Nobel Prize winners, on the issues at stake in this case.

Here I will focus on three of the numerous points on which I disagree with Dr. Stavins: the treatment of non-use values, the basis for habitat replacement cost estimates, and the validity of societal revealed preferences. My conclusions on these issues, in short, are that

- Dr. Stavins ignores the extensive evidence that EPA's non-use values are conservative underestimates;
- Habitat replacement cost valuation is similar to standard approaches to asset valuation used through the economics literature, and provides a

reasonable approach to valuation of large but uncertain ecosystem benefits; and

- Societal revealed preference is a reasonable approach to the problems of social choice, which are intrinsically different from the individual choice paradigm that is assumed in Dr. Stavins' preferred approach.

Finally, despite our differences, Dr. Stavins and I agree that there are enormous methodological difficulties in complete valuation of the benefits of reducing cooling water intake requirements, but we disagree about the implications of these challenges. Dr. Stavins urges EPA to wait to regulate until the valuation methodologies of economists catch up to the environmental aspirations of the Clean Water Act. I, in contrast, conclude that the difficulties in valuing environmental benefits illustrate the limits to the usefulness of cost-benefit analysis in the environmental setting. In contrast to the cost-benefit analysis EPA now appears to endorse, identification of the best available technology is a process in which costs are only one of many factors to be considered, and benefits need not be precisely quantified and monetized in order to be taken seriously. A recommendation based on the best available technology could be made, as has been done for numerous regulations in the past, without entangling the agency in the massive web of methodological, technical, and even philosophical challenges to cost-benefit calculations.

My detailed comments are organized in the following sections:

1. Evidence of the incompleteness of EPA's benefit estimates

2. Adjustment of EPA benefit estimates to address selected problems of incompleteness
3. General comments on Dr. Stavins' arguments
4. Survey of non-use values and updated estimates of their magnitude
5. Rationale for use of habitat replacement cost
6. Problems of social choice and the use of societal revealed preference
7. Limitations of cost-benefit analysis and merits of the "best available technology" standard

1. The incompleteness of EPA's benefit estimates

Cost-benefit analysis is designed to weigh the relevant costs of a proposal against the corresponding benefits. This process cannot yield a meaningful result unless the calculations of costs and benefits are equally complete. In the private sector, a balance sheet that weighs all of a company's income against *some* of its expenditures does not provide a useful picture of the company's true financial condition, as recent corporate scandals have reminded us. Likewise, in the public sector, a comparison of complete costs and incomplete benefits does not provide an accurate picture of net benefits to society.

Yet a comparison of complete costs and incomplete benefits is exactly what EPA has produced in this case. The costs of reducing the impacts of cooling water intake are monetary costs for marketed goods and services, such as production and installation of screens, cooling towers, and other equipment. Such costs are backed up by detailed engineering analyses, and often by recent experience in buying and installing similar

equipment. There are no categories of costs which are intrinsically difficult to express in monetary terms.

Contrast this with the calculation of the benefits of reducing cooling water intake. In general terms, the benefits consist of reduced damage to aquatic ecosystems. But how should those benefits be measured and monetized? EPA's analysis focuses on a more restricted question, namely valuing the benefits of killing fewer fish; this is already a complex problem with no simple answers. Market prices are available only for a few commercially valuable fish species; even when available, commercial prices do not necessarily capture all the value of avoided fish mortality. And avoided fish kills are far from the only significant benefits of reduced ecosystem damages, since many other organisms and environmental services are also affected.

EPA's economic benefit analysis (EBA) explicitly describes the categories of benefits that have been omitted. EBA Chapter C1, particularly section C1-5, lists the following reasons why the environmental impacts of cooling water intake structures, and consequently the benefits of regulating them, are underestimated:

- Facility-provided monitoring data, the basis for EPA's analysis, typically focus on only a subset of the species impacted by impingement and entrainment (I&E), thus underestimating total losses.
- Monitoring data often pertain to conditions existing many years ago, before the Clean Water Act had improved aquatic conditions; if the numbers and diversity of fish were depressed by degraded water

quality, estimates of I&E losses would be similarly low.

- Cumulative impacts of multiple facilities on the same fish population are often important, but have been considered only to a limited extent.
- Estimated recreational and commercial values include only the proportion of I&E losses that would have been caught, typically less than 20 percent of I&E mortality of recreationally and commercially valuable species.
- Secondary economic impacts such as effects on marinas, bait sales, and property values have not been included.
- Losses of invertebrate species such as lobsters, mussels, crabs, and shrimp were not included, even though these include commercially valuable species.
- Effects on fish-eating (piscivorous) birds were not included.
- Current fishing mortality rates often reflect already-depleted fisheries, as for example in the case of winter flounder near the Brayton Point facility, one of the EBA case studies.
- Forage species, accounting for the predominant share of I&E losses, are poorly documented, and their full ecological value to the food web is not considered.
- Non-use benefits are estimated only for recreational users, not for the population as a whole.
- Thermal impact reductions are not accounted for in some options, such as replacement of once-through cooling with cooling towers.

Another portion of the EBA, Case Study Chapter A11, re-examines the areas of incompleteness from a different perspective, focusing on the ecological services that are disrupted by I&E, but are not addressed by conventional valuation methods. Quoting directly from the EBA, those omitted or undervalued services include:

- decreased numbers of ecological keystone, rare, or sensitive species;
- decreased numbers of popular species that are not fished, perhaps because the fishery is closed;
- decreased numbers of special status (e.g., threatened or endangered) species;
- increased numbers of exotic or disruptive species that compete well in the absence of species lost to I&E;
- disruption of ecological niches and ecological strategies used by aquatic species;
- disruption of organic carbon and nutrient transfer through the food web;
- disruption of energy transfer through the food web;
- decreased local biodiversity;
- disruption of predator-prey relationships...
- disruption of age class structures of species;
- disruption of natural selection processes;
- disruption of public uses other than fishing, such as diving, boating, and birding; and
- disruption of public satisfaction with a healthy ecosystem.

(EBA Case Studies, p. A11-2.)

This second list is presented as part of the rationale for HRC valuation, a method that can encompass the

full diversity of ecosystem values. My comments on HRC appear in section 5 below.

It would be impossible in practice to estimate all of these omitted values. However, benefit analyses for other proposed rules have estimated a broader set of values. For example, the economic and environmental benefits analysis for the metal products and machinery (MP&M) rule estimated separate recreational benefits for fishing, other boating, and wildlife viewing and near-water activities. Recreational fishing accounted for only one-fourth of all recreational benefits from reduced MP&M discharges.[2] EPA has now issued a Notice of Data Availability for the MP&M rule; it suggests that the estimates of recreational benefits were increased in response to peer reviewers' comments.[3] If similar relationships hold for the recreational benefits of reductions in cooling water intake, then EPA's estimates of recreational benefits in the 316(b) analysis should be multiplied by 4 or more. However, the data needed to determine the magnitude of other recreational benefits are not presented in the EBA. I recommend that EPA should explore the impacts of cooling water intake structures on the other recreational benefits considered in the MP&M analysis, and increase its estimates of recreational benefits of cooling water intake reduction whenever appropriate.

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[2] *Economic, Environmental and Benefits Analysis for the Proposed Metal Products and Machinery Rule* (EPA 821-B-00-0008, December 2000, available at www.epa.gov/waterscience/guide/mpm/rule.html), Chapter 15; the results in Table 15-13, p.15-17, show that recreational fishing accounts for 24% of the midpoint values for recreation benefits as a whole.

[3] *Federal Register*, June 5, 2002, p. 38774.

The two lists of omissions and underestimates presented here — both taken directly from the EBA — are more than sufficient to demonstrate the incompleteness of the benefits analysis in this case. Complete costs are being compared to a restricted subset of benefits; the bottom line of such a lopsided comparison slants heavily in a predictable direction, toward "justifying" less regulation and weaker environmental protection than a complete analysis would support. All that can be concluded from this misleading, incomplete comparison is that true, complete benefits must be larger, and net social benefits larger as well, for each of the various options under consideration.

2. *Summary account of adjustment of EPA benefit estimates*

I have prepared an adjusted set of figures incorporating estimates of corrections to just two of EPA's omissions and underestimates. This section presents my calculations; the rationale for the first correction appears in section 4 below.

My first adjustment is for the underestimate of non-use benefits. As I discuss in section 4, a recent literature review finds that non-use benefits are on average 1.9 – 2.5 times all use values, rather than 0.5 times recreational benefits alone as EPA assumed. My reading of the recent literature suggests that 1.9 – 2.5 times use value is still a conservative estimate for existence values of many natural ecosystems. To correct for EPA's underestimate in this area, I have recalculated their estimates assuming that non-use values are 2 times estimated recreational, commercial, and forage values.

My second adjustment is for the unvalued fraction of the mortality of recreationally and commercially valuable species. EPA's methodology values only the fraction of those species that would have been caught in the absence of I&E mortality. That is, I&E mortality rates are adjusted downward in proportion to historical catch rates before any valuation occurs in the EBA. Only the fraction of the fish that would have been caught are assigned any value; the rest are ignored. The catch rate, or "landed fraction," is below 20% in every case, and below 10% in some cases.[4] Thus the great majority of I&E mortality of the most valuable species is never valued.

The nonlanded fraction of these species — the ones that survive uncaught — have an obvious ecological value. If nothing else, their reproduction is the source of the catch in future years; that is, they are essential to the creation of future recreational and commercial values. A catch rate of 100%, if it occurs, can only occur once. The available data do not allow calculation of the present value of future reproduction of nonlanded fish; the calculation would be complex and would likely vary by species. It seems reasonable to assume that nonlanded fish have a value that is significantly greater than zero, but not more than the value of the landed

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[4] Data on the landed fraction of commercially and recreationally valuable species can be found in the EBA for every case study except Ohio. EPA's answers to Riverkeeper questions, received very late in the process of my analysis, imply a landed fraction of about 1-2% for Ohio; this appeared remarkably out of line with other case studies. My calculations conservatively assume a landed fraction of 10% for the Ohio case study. Use of EPA's Ohio data would lead to higher estimates of benefits in my Scenarios B and C in Table 1, below.

(caught) fish of the same species. I have conservatively assumed that nonlanded fish have a value equal to 0.25 times the value of landed fish of the same species. That is, I have created a new category of inferred recreational and commercial value in the case studies, as follows:

Value of nonlanded recreational and commercial fish	=	*Value of landed recreational and commercial fish) x (nonlanded fraction / landed fraction)* x *0.25*

To calculate the effects of these adjustments, it was first necessary to construct a spreadsheet system that reproduces EPA's estimates. This spreadsheet reproduces in detail the benefit categories for each of the EBA case studies, extrapolates to best estimates of national baseline losses using the relationships described in the EBA, and then adjusts for the percentage reduction in losses achieved by each EBA policy option.[5] My spreadsheet calculates national baseline losses, and benefits of each policy option,

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[5] In additional stage of adjustments would have been necessary to convert to the policy options as presented in the Federal Register. EPA's explanation of these adjustments, in response to my questions, was received late in the process of my analysis. Therefore I did not develop calculations to match the Federal Register categories. In several of the key cases, EPA's estimates of Federal Register options benefits are about 95% of corresponding EBA benefits, suggesting that my conclusions apply almost equally to Federal Register options. The difference between Federal Register and EBA benefits includes both the distinction between estimates for 539 vs. 550 plants, and differences in the treatment of taxes.

replicating EPA's values when using EPA's assumptions.

I then recalculated the spreadsheet three times: in Scenario A, keeping all EPA assumptions and input data, except assuming that non-use value is 2 times recreational, commercial and forage value; in Scenario B, restoring EPA's non-use assumption but assuming that nonlanded recreational and commercial fish are valued according to the above equation; and in Scenario C, combining my two assumptions. The results, as shown in Table 1 (next page), are:

- Estimated benefits of each policy option are more than doubled in Scenario A, relative to the estimates in the EBA;
- Estimated benefits of each policy option are roughly doubled in Scenario B; and
- In Scenario C, combining my two adjustments, benefits of policy options are roughly 4–6 times the estimates in the EBA.

When compared to the costs of the policy options, as reported in the EBA, my three scenarios of course have much greater net social benefits. The order of policy options, ranked according to net social benefits, is changed: Option 5 – the dry cooling option – has the greatest net benefit in all three scenarios, as shown in Table 2. In Scenario C, combining the two adjustments, EPA's proposed option, i.e. EBA Option 3, is the one that fares worst. Options 1, 2, 3a, and 4 all have net benefits of $4.1 – $4.5 billion in Scenario C.

Because my rough estimates of these two changes have such a large effect on the outcome of the analysis,

I recommend that EPA explore both issues in greater detail. Specifically,

1. EPA should develop approaches to non-use value more consistent with the recent economic literature, to replace the outmoded "50% rule" used in the EBA; and
2. EPA should develop plausible values for the nonlanded fraction of I&E fish mortality. The one thing we know for certain is that the current estimate of zero is *not* the correct value.

An enormous amount is at stake here: my two adjustments show that all options have large net benefits, and that EPA's incomplete valuation of benefits misleadingly favors the option that has the lowest net benefits on a corrected basis. Thus it is important that EPA explore these corrections in detail.

Table 1: Benefits of EBA Policy Options

(millions of dollars)

Option	EBA	Scenarios A	Scenarios B	Scenarios C
1	$ 1,034	$ 2,348	$ 2,091	$ 5,517
2	$ 890	$ 2,043	$ 1,814	$ 4,815
3	$ 735	$ 1,705	$ 1,515	$ 4,047
3a	$ 749	$ 1,793	$ 1,693	$ 4,625
4	$ 1,223	$ 2,933	$ 2,775	$ 7,589
5	$ 1,536	$ 3,731	$ 3,553	$ 9,782
6	$ 1,159	$ 2,666	$ 2,362	$ 6,274

Scenario definitions: EPA data and assumptions used except

A: Nonuse value = 2 * recreational, commercial & forage values

B: Nonlanded recreational and commercial fish valued at 0.25 * landed fish of same species

C: Combines assumptions of A and B

Table 2: Net Benefits of EBA Policy Options

(millions of dollars)

		Net Benefits			
			Scenario		
Option	*Costs*	EBA	A	B	C
1	*$ 969*	$ 65	$1,379	$1,122	$4,548
2	*$ 610*	$ 280	$1,433	$1,204	$4,205
3	*$ 283*	$ 452	$1,422	$1,232	$3,764
3a	*$ 300*	$ 449	$1,493	$1,393	$4,325
4	*$ 3,507*	$(2,284)	$ (574)	$ (732)	$4,082
5	*$ 2,054*	$ (518)	$1,677	$1,499	$7,728

Costs for Option 6 were not calculated in the EBA.

3. General comments on Dr. Stavins' arguments

Dr. Stavins argues repeatedly that EPA's benefits analysis violates the canons of approved economic theory. As he says on page 1, "some of the methodologies employed are neither recommended nor endorsed by EPA's own *Guidelines for Preparing Economic Analysis...*" This is the first of at least 16 mentions of the *Guidelines* in his 43 pages of comments; it is by far his most frequent source, repeatedly cited as the final, definitive source on allowable methods.

However, when the *Guidelines* were first approved, Dr. Stavins had a more flexible view of the document. The *Guidelines* were reviewed by EPA's Science Advisory Board — Environmental Economics Advisory Committee (EEAC), chaired by Dr. Stavins. The EEAC review of the *Guidelines* said, in its Executive Summary,

> Economics, like any scholarly discipline, is constantly changing. Environmental economics, a relatively young branch of the discipline, has experienced particularly rapid growth. New areas of the literature continue to emerge, and existing areas change and expand. Hence, despite the Committee's generally positive assessment of the revised Guidelines, we urge EPA to carry out new reviews every two to three years.[6]

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[6] Science Advisory Board Report on the EPA Guidelines for Preparing Economic Analysis, published as Appendix A to the *Guidelines*, p.1.

The cover letter signed by Dr. Stavins, transmitting the EEAC review of the *Guidelines* to Carol Browner, the EPA Administrator at the time, likewise said,

> The best analytical tools of environmental economics are constantly changing, as experience with applications of existing tools and as new theoretical and empirical techniques appear in the scholarly literature. As a result, it is important that EPA carry out new reviews of the Guidelines every two to three years to reflect these developments in environmental economics.[7]

Although the *Guidelines* were officially published in September 2000, the EEAC review occurred in 1998-99; the cover letter to Carol Browner is dated September 30, 1999. Thus it is now three years later, the time at which, according to the EEAC — and the Dr. Stavins of 1999 — a new review of the *Guidelines* would be called for. Dr. Stavins got it right the first time, in 1999: environmental economics is a fast-changing field, and it is important to take a fresh look at it, rather than being bound by scriptural references to a report from some years ago.

Looking more generally at the world of environmental economics and policy analysis, the choice of techniques for valuation of benefits, and the application of cost-benefit analysis to legal and regulatory issues, remain the subjects of active debate. Recent special issues of the *Journal of Legal Studies* and the *University of Pennsylvania Law Review* have

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[7] Letter to Carol Browner from Joan Daisey and Robert Stavins, September 30, 1999, included in Appendix A of the *Guidelines*.

highlighted the ongoing differences of perspective on these issues among legal scholars and economists.[8]

The economics profession as a whole is exhibiting an increasing interest in alternative perspectives that question the conventional textbook wisdom. Two of the last four Nobel Prizes in economics have gone to scholars who are famous for their unorthodox views. Amartya Sen, the 1998 Nobel laureate, has raised fundamental questions about the nature of social choice, ethics, and equity in economics, including recent comments on cost-benefit analysis that I will discuss in section 6 below. The 2001 prize went to Joseph Stiglitz, George Akerlof, and Michael Spence, economists who have analyzed the problems of imperfect and asymmetric information — problems that require fundamental rethinking of the optimality of markets, and create a strong case for the benefits of regulation.

Several "heterodox" schools of economics have emerged in recent years, raising questions and developing methodologies that go beyond the conventional limits of economic theory. Ecological economics is one of the fastest-growing new perspectives, represented by the International Society for Ecological Economics and the journal *Ecological Economics*. Alternative approaches to ecosystem valuation, and studies of the role of "natural capital," are frequent topics that have received insightful

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[8] *Journal of Legal Studies* 29 no. 2, part 2, June 2000, and *University of Pennsylvania Law Review* 150 no. 5, May 2002, are both devoted to discussion of cost-benefit analysis. For my own views on the discussion see Frank Ackerman and Lisa Heinzerling, "Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection," *University of Pennsylvania Law Review* 150 no. 5, 1553-1584.

analysis by ecological economists, with direct relevance to the issues raised in the current rulemaking procedure.

In short, it is increasingly inaccurate to say that there is a single, narrowly defined approach to economic theory, environmental economics, or the evaluation of ecological benefits. If EPA's past guidelines for economic analysis were as rigidly defined as Dr. Stavins now suggests, perhaps EPA should begin the next review of those guidelines with a broader representation of the full range of contemporary views on environmental economics. As Dr. Stavins anticipated in 1999, it is now time for a fresh look at the progress of the field.

4. Survey of non-use values and updated estimates of their magnitudes

EPA's approach to non-use values is one of the least defensible aspects of the EBA. Environmental economics increasingly recognizes the importance of non-use values: people place a substantial value on the mere existence of animals, ecosystems, wildernesses, and unique natural locations, quite apart from any past, present, or planned future use of those aspects of nature. It is frequently the case that existence values dwarf use values: in the Exxon Valdez oil spill, a court awarded compensatory damages — compensating for lost use values — of less than $300 million to those who lived and worked near Prince William Sound; economists using contingent valuation techniques estimated the existence value of the pristine environment of Prince William Sound at $9 billion, or 30 times use value.

The ratio of non-use value to use value is important here, because EPA uses an unfounded hypothesis about this ratio to estimate non-use value. Based on just a few, very dated citations, EPA suggests that non-use value can be estimated as 50% of the recreational component of use value. EPA notes that this is intended only as an estimate of non-use value to recreational users; there is no reason, however, to restrict the calculation of non-use value to this subset of the population. Here I am happy to agree with Dr. Stavins when he contends that the 50% rule is entirely inappropriate, since it fails to address any of the more recent literature on the subject. We differ, however, on the appropriate alternative.

A 1993 literature review by Thomas Brown — significantly newer and more comprehensive than the sources for the 50% rule — examines 31 contingent valuation studies published since 1980 that have estimated non-use values.[9] Some of these studies contained multiple estimates, leading to 34 comparisons of non-use to use value for the same environmental benefit. The median ratio of non-use to use value was 1.92. After a thoughtful review of the varied methods used in the studies, Brown identifies 22 comparisons that appear to be more reliable than the others; these higher-quality comparisons have a median ratio of 2.56. It is on the basis of this study that I adopted the ratio of non-use to use value of 2 for the purpose of my

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[9] Thomas C. Brown, "Measuring Nonuse Value: A Comparison of Recent Contingent Valuation Studies," in J.C. Bergstrom, editor, *Benefits and Costs Transfer in Natural Resource Planning*, Sixth Interim Report, University of Georgia, Department of Agricultural and Applied Economics, Athens GA, 1993.

recalculations presented in Tables 1 and 2 above. The Brown study contains a wealth of information about the effects of different methods of estimation on non-use value, and its relationship to use value, beyond the median ratio that I have used. I recommend that EPA explore additional uses of Brown's analysis, in devising more appropriate estimates of non-use value for the case studies.

Revised assumptions about non-use value have a large effect on net benefits. As shown in Table 1, moving from EBA estimates to my Scenario A, introducing the higher non-use value alone, adds $1 – 2 billion to the benefits of the various policy options. Billion-dollar existence values, and more, for nationwide benefits are relatively common in the environmental economics literature.[10] Studies have repeatedly found very large non-use values; these values are best understood as a quantitative expression of widespread public concern about environmental resources — even in the absence of personal use.

One of the studies cited by Brown found a nationwide non-user willingness to pay of $111 per household for improving water quality in all U.S. rivers and lakes to a fishable level — implying a nationwide total value of more than $11 billion in 1981 dollars, or

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[10] See, among many others, John B. Loomis and Douglas S. White, "Economic Benefits of Rare and Endangered Species: Summary and Meta-analysis", *Ecological Economics* 18 (1996), 197-206; and V. Kerry Smith and Laura L. Osborne, "Do Contingent Valuation Estimates Pass a 'Scope' Test? A Meta-analysis," *Journal of Environmental Economics and Management* 31 (1996), 287-301. The nationwide, per-household values in each of these articles, based on reviews of many other studies, imply multi-billion dollar national totals.

closer to $20 billion in today's dollars.[11] This remarkable figure emphasizes the great importance that people place on water quality, putting the benefit estimates for the current case in a broader perspective. Dr. Stavins' casual and undocumented suggestion that non-use values might be close to zero for this case appears to be quite at odds with the evidence of substantial non-user willingness to pay for improved water quality.

Other studies routinely find vast existence values for endangered species, for clean air in national parks, and other environmental resources and amenities. The surprising value, the figure that is out of line with the recent literature, is the very low estimate of non-use value found in the EBA. Revising this value up to a level more consistent with the literature, as shown in my Scenarios A and C, causes a fundamental change in the evaluation of the policy options considered by EPA.

5. Rationale for use of habitat replacement cost

In several of the case studies, the EBA uses calculations of habitat-based replacement cost (HRC) to value the damages due to impingement and entrainment. The rationale for this method is straightforward, although different from other approaches to valuation. Natural ecosystems produce numerous interrelated benefits, some of which are hard

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[11] Robert C. Mitchell and Richard T. Carson, "An Experiment in Determining Willingness to Pay for National Water Quality Improvements," preliminary draft of a report to EPA, Resources for the Future, 1981, as cited in Brown, supra note 9. My calculations in the text reflect the facts that there are more than 100 million households in the U.S. today, and average prices, as measured by the Consumer Price Index, have almost doubled since 1981.

to quantify (see the lists of omitted benefit categories in section 2 above). Even if they all could be quantified, separate valuation of the entire list of ecosystem services is an impractical task. A simpler approach is to calculate the replacement cost of the ecosystem that provided the array of services.

Restoration cost is used as a measure of damages under CERCLA for Superfund sites, under the National Marine Sanctuaries Act, and under the oil spill provisions of the Clean Water Act. Use of restoration costs was explicitly upheld in the landmark *Ohio vs. Interior* court decision of 1989. I recommend that EPA revise and expand the EBA Case Studies Chapter A11, explaining and supporting HRC calculations, discussing the theoretical basis for HRC, and identifying categories of ecosystem value that are not measured by any other techniques.

Dr. Stavins finds HRC to be even more objectionable than other aspects of the EBA, describing it as "completely illegitimate" and "fatally flawed." Yet again, we have only his word to go on, with little in the way of documentation. My reading of the literature is quite different; it appears to me that standard texts on environmental economics are *not* filled with warnings against the dire perils of the avoided cost method of benefits estimation.

Indeed, valuation of assets at replacement cost is a common practice in economics. In macroeconomics, depreciation is routinely valued at replacement cost; the difference between historical book value and market value (market value *is* current replacement cost, for a marketed asset) is essential in understanding investments. Any detailed analysis of capital costs

focuses on "economic depreciation", or the replacement cost of the capital that is consumed, and distinguishes it from accounting measures of depreciation based on book value or tax laws.[12]

Insurance companies frequently value damages to property at estimated replacement cost. If any of us should experience a loss, our home insurance provider might pay us on the basis of "household replacement cost" — unless we have explained to them that the calculation is fatally flawed and insisted on using a much lower value, as Dr. Stavins proposes to do for ecosystems.

Another important disagreement lurks behind these comments. Are the natural resources that are affected by cooling water intake best thought of as long-lived capital goods — or are they more like consumer goods that people, or power plants, might choose to consume when they are hungry? If you eat the last cookie and then throw out the box, you may not have to pay the full "cookie replacement cost." Perhaps you are getting tired of cookies and don't plan to buy any more, so there is no need to worry about replacement cost. Something along these lines seems to be involved in the claim that HRC overstates the value of environmental resources: if we are planning to consume the ecosystem without replacement, then HRC might overestimate the values at stake.

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[12] There are numerous examples, such as Frank C. Wykoff, "Economic Depreciation and the User Cost of Business-Leased Automobiles," and other essays in Dale W. Jorgenson and Ralph Landau, editors, *Technology and Capital Formation* (MIT Press, 1989).

A cookie box is not an appropriate analogy for the environmental resources protected by the Clean Water Act. Rather, the aquatic ecosystems under discussion in this case are long-lived assets, comparable to capital goods, which provide a wide range of valuable services. Society values and plans to keep these assets for the long run, and expects to receive their services year after year. The view of nature as "natural capital" is one of the foundations of ecological economics; but more conventional environmental economists have also argued that natural resources should be analyzed as assets, i.e. comparable to capital rather than consumer goods.[13]

HRC often looks more expensive than conventional approaches to valuation, as Dr. Stavins emphasizes. But this may simply reflect the incompleteness of conventional valuation, as discussed in section 2 above. Ecosystems provide numerous services simultaneously, using the same "capital equipment" to produce multiple benefits. Many of these benefits are not normally evaluated, but should be. As the list of separately evaluated benefits grows longer, the total benefit will of course increase. If we were able to achieve complete evaluation of ecosystem benefits, assuming that each benefit had to be produced and evaluated separately, we might well find that the totals exceeded HRC estimates. Nature has evolved efficient and parsimonious ways of producing many ecosystem

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[13] "Examples abound in the scientific literature supporting the asset interpretation of environmental resources." V. Kerry Smith, *Estimating Economic Values for Nature: Methods for Non-Market Valuation* (Edward Elgar, 1996), p.7. See also Smith's subsequent discussion of the "asset interpretation."

services from limited resources; it would be surprising if artificial substitutes were routinely cheaper.

Although HRC is the only valuation method that even comes close to capturing the full range of ecosystem services, it, too, has shortcomings. In practical terms, it appears difficult and expensive to perform adequate HRC calculations; even more than with other valuation techniques, time and budget constraints may often limit the applications of HRC. Speaking more theoretically, HRC may at times be inappropriate because some ecosystems and natural services are not replaceable. If environmental damages involve risks of extinction of species, destruction of unique resources, or even disruption that allows unwanted invasive species to occupy vacated ecological niches, there may be no way to undo what has been done. Calculation of habitat replacement costs for regulatory purposes have often involved cost estimates for generic wetland restoration, an approach that captures only some of the ecosystem services that are at risk.

Despite these limitations, HRC remains a valuable contribution to the process of valuation whenever it can be used. I recommend that EPA explore HRC valuation of additional sites, to broaden the data and analysis used in the estimates of benefits in this case.

6. *Problems of social choice and the use of societal revealed preference*

To value the effects of cooling water intake on threatened and endangered species, EPA employs an innovative method described as "societal revealed preference" in the case study of the San Francisco Bay estuary plants. Essentially, the method assigns values

based on the amounts that society has been willing to pay for protection of similar threatened and endangered species in other contexts. Economists have frequently deduced individual "revealed preference" for environmental amenities from individual behavior in other markets; here EPA simply extends the same reasoning to social behavior and social choices. Dr. Stavins again displays his hostility to theoretical innovation, describing this procedure as having "no foundation whatsoever in economic theory"; it is in his view "totally invalid... a complete corruption of the notion of a *revealed-preference* method... a complete sham..."

The revealed preference procedure employed by EPA would be entirely orthodox and familiar, even qualifying for endorsement by Dr. Stavins and the *Guidelines for Preparing Economic Analyses*, if it referred to individual rather than social choice. Thus the question at issue can be restated: is it totally invalid and a complete sham to consider issues of social choice, separately from individual choice? Both economic theory and political reality show that there is an irreducible, independent role for social choice.

In economic theory, Kenneth Arrow's impossibility theorem proved long ago that there is no universal "social welfare function" — that is, no mathematical function of individual choices always produces meaningful social choices.[14] Questions of public goods and public choice continue to challenge the standard

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[14] More precisely speaking, Arrow proved that there is in general no social welfare function that depends solely on individual preferences for relevant alternatives and avoids intransitivity, unless it is dictatorial (always agreeing with one individual no matter what others prefer).

model of individual choice; as textbooks often point out, there is no such thing as an individual demand curve for national defense. (Nor are there cost-benefit analyses to determine how much defense spending is "efficient" based on individual revealed preferences.) Any attempt to convert defense spending to a matter of individual purchases or private willingness to pay would be overwhelmed by the "free rider" problem: why pay for your individual share of defense, since your neighbors' contributions will defend you as much as them?

Exactly analogous questions arise in environmental economics. Nobel laureate Amartya Sen, in recent comments on cost-benefit analysis, points out that individual willingness to pay for major environmental initiatives is not always meaningful: if the amount you would contribute to cleaning up an Exxon Valdez-sized oil spill does not depend on whether anyone else contributes anything, then you have not understood the nature of the problem. On the other hand, if the question is how much would you contribute if everyone else contributes the same amount, we are no longer discussing *individual* willingness to pay. As Sen puts it:

> The very idea that I treat the prevention of an environmental damage just like buying a private good is itself quite absurd. The amount I am ready to pay for my toothpaste is typically not affected by the amount you pay for yours. But it would be amazing if the payment I am ready to make to save nature is totally independent of what others are ready to

> pay for it, since it is specifically a social concern.[15]

Dr. Stavins drifts out of economic theory and into political debate when he argues against societal revealed preference on the grounds that preferences must be "revealed by those individuals who are doing the paying, *not* by the judgment of others (in this case, legislatures, executive departments and agencies, and/or courts)." (Stavins comments, p. 27) Denouncing the supposed arbitrariness and unrepresentativeness of all government actions has become unfortunately fashionable; but in this case it is necessary to look beyond the rhetoric. Who exactly is paying for the actions of legislatures, executive agencies, and courts? Ultimately, the answer can only be the taxpayers, ratepayers (consumers), and shareholders — that is, society.

Do people feel that the decisions about environmental protection, made on their behalf by their elected representatives, are hopelessly inefficient and expensive? Is there a groundswell of popular demand to save money by eliminating the Clean Air Act, the Clean Water Act, protection for endangered species, and all the rest? Of course not. On the contrary, many successful politicians have figured out that people strongly prefer environmental protection, and are willing to have their money spent to back up that preference. That's how democracy is supposed to work, with or without the blessing of conventional economic doctrine. Social choice is alive and well in

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[15] Amartya Sen, "The Discipline of Cost-Benefit Analysis," *Journal of Legal Studies* 29 no. 2 part 2 (June 2000), pp. 931-952; quote from 949.

environmental policy, and cannot always be deduced from isolated individual behavior. Dr. Stavins is able to "prove" that individual preferences are necessarily more legitimate than social preferences only by assuming that answer to begin with.

There is one more piece to the case against inferring social values from past regulation, as seen in the "societal revealed preference" approach; this final argument is implicit rather than explicit in Dr. Stavins' comments. It is often said that past regulations, adopted without the benefit of careful economic analysis, have been disastrously expensive. Long lists of regulations, purporting to show wildly differing costs per life saved, are frequently cited as evidence of the need for cost-benefit analysis, rather than reliance on regulatory precedent. The lists, however, can almost always be traced back to just two original studies of the costs of regulation. Careful reading of those original studies reveals that they are routinely misquoted: they are studies of the costs of actual *and proposed* regulations, or in one case, actual, proposed, *and other possible* regulations that have never even been proposed by any agency.[16] The ridiculously expensive regulations described in these studies are almost entirely the ones that were never adopted. In many cases, EPA and other agencies rejected the expensive proposed regulations, precisely because they were too expensive — evidence of the success, not failure, of past regulatory practice.

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[16] Lisa Heinzerling, "Regulatory Costs of Mythic Proportions," *Yale Law Journal* 107 no. 7 (May 1998), pp. 1981-2070; Lisa Heinzerling and Frank Ackerman, "The Humbugs of the Anti-Regulatory Movement," *Cornell Law Review* 87 no. 2 (January 2002), pp. 648-670.

Since social choice cannot be reduced to individual choices, and past regulations are not nearly as expensive as is commonly believed, EPA's "societal revealed preference" method is a promising new innovation in the methods of valuation, one that deserves further development and discussion.

7. Limitations of cost-benefit analysis and merits of the "best available technology" standard

To summarize briefly, I have demonstrated that EPA's analysis of the benefits of reducing cooling water intake is incomplete, and underestimates true, complete benefits by an unknown but large amount. Just two corrections — accounting for the large "non-landed fraction" of I&E mortality of valuable species and increasing non-use values to levels more in line with the recent economics literature — add billions of dollars to the benefits of each regulatory option. These adjustments show that EPA's proposed option does not maximize net social benefits. Dr. Stavins is not persuasive in his arguments for banning innovation in economics and lowering benefit estimates throughout the analysis. Two of the innovations adopted by EPA in this case, habitat-based replacement cost (HRC) and societal revealed preference, are useful contributions to the fast-changing field of environmental economics, and deserve to be analyzed in depth and applied more widely.

It is clear that there is no consensus on these issues. One of the few things that Dr. Stavins and I agree on is that EPA's published benefit estimates are an insufficient basis on which to make a decision in this case. The plain truth of the matter is that cost-benefit analysis has failed in its fundamental political ambition.

Rather than providing an objective, transparent standard for cost-effective decision-making, cost-benefit analysis has become a partisan battleground where opposing parties fight over rival technical hypotheses about environmental valuation.

Fortunately, cost-benefit analysis is not required in this case. There is no reason to base the regulation of cooling water intake on an analysis that is neither required by law, nor close to complete representation of benefits, nor successful in achieving objectivity and transparency. My Scenario C (refer to Tables 1 and 2 above), combining my two revised estimates, makes it clear that every policy option under consideration has substantial net social benefits. Any choice of the "best available technology" from among these options will bring social benefits greater than its costs; options that achieve the greatest reduction in cooling water intake generally appear to have the greatest benefits.

In the end, only one question of "willingness to pay" matters for the politics of regulatory policy. It is a much broader, less technical question than the ones raised in the EBA. Any regulation will impose some costs; power plant operators will undoubtedly pass those costs on to their customers. So the question that ultimately matters is, are ratepayers willing to pay the increased costs imposed by regulation?[17] As Synapse

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[17] One could also examine the impact on the plant owners. EPA did in fact discuss comparison of the costs of the rule to the revenues of the affected companies. But Dr. Stavins, commenting on behalf of PG&E [TRACKED EDIT: "PG&E" replaced previous text: "the corporate owner of Brayton Point"], says, "The comparison [of regulatory costs to company revenues] is utterly irrelevant!... Although such a socially efficient technology [one endorsed by Dr. Stavins' analysis] maximizes net benefits to

Energy Economics has estimated in their comments on this rule, if all costs were passed on to the consumer, an all cooling tower rule would cost each ratepayer 28 cents per month on their electric bills. If the public was asked, "Are you willing to pay 28 cents more per month on your electric bill to avoid massive fish mortality and other underwater environmental damages caused by power plants?", I feel confident the answer would be "yes." And if people are willing to pay the costs of environmental protection, there is no way for experts to prove that they are wrong.

Sincerely,

Frank Ackerman

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society, it may yield higher costs than benefits to an affected company." (Stavins comments, pp. 11, 12)

State Water Resources Control Board

[graphic omitted]
Vinston H. Hickox
Secretary for Environmental Protection

[graphic omitted]
Gray Davis
Governor

Executive Office
1001 I Street • Sacramento, California 95814 • (916) 341-5615
Mailing Address: P.O. Box 100 Street • Sacramento, California • 95812-0100
FAX (916) 341-521 • Web Site Address: http://www.swrcb.ca.gov

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[AUG 5 2002[[AUG 6 2002]

Proposed Rule Comment Clerk-W-00-32
U.S. Environmental Protection Agency
Cooling Water Intake Structure (Existing Facilities: Phase II)
Water Docket, Mail Code 4101
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

COMMENTS ON NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PROPOSED REGULATIONS TO ESTABLISH REQUIREMENTS FOR COOLING WATER INTAKE STRUCTURES AT PHASE II EXISTING FACILITIES (PROPOSED RULE)

Thank you for the opportunity to comment on the Proposed Rule for cooling water intake structures at existing Phase II facilities that was published in the Federal Register on April 9, 2002. I am submitting these comments on behalf of the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (Regional Boards). These agencies have been delegated the authority to implement the National Pollutant Discharge Elimination System (NPDES) program in California. Comments on the Notice of Data Availability for Phase I were submitted on August 24, 2001.

Background

The Proposed Rule would affect 19 existing power plants in California. These power plants are listed in the Enclosure. Of these 19 facilities, nine draw water from the Pacific Ocean. The others draw water from bays, harbors, deltas, and estuaries. Environmental factors have affected the aquatic populations in these water bodies. These factors include pollution, reduction of freshwater inflows, loss of wetland habitat, invasive species, overfishing, thermal discharges and water intakes.

California recently deregulated its electrical utilities and required its privately owned utilities to sell their power plants to other companies. The purpose of this was to separate the delivery of power from the generation of power. The privately owned utilities complied with this requirement and sold their power plants, except for two nuclear power plants, the San Onofre Nuclear Generating Station and the Diablo Canyon Nuclear Power Plant. The new owners have been modernizing the power plants by adding new combined cycle units or replacing existing simple cycle units with combined cycle units. Projects of this type have been completed at Huntington Beach, are under construction at Moss Landing, have been approved at Contra Costa, and are under review at Potrero, Morro Bay, and El Segundo. The modernization will most likely continue until all the old single cycle units, except for the nuclear units, are replaced.

The modernization projects are being reviewed by the California Energy, Conservation and Development Commission (California Energy Commission) and the Regional Boards. To complete these reviews, the agencies have required biological studies to be completed to evaluate the impacts of the cooling water intake structures. These projects have been controversial. For various reasons, including the effects of the cooling water intakes, the public has expressed concerns about the continued use of the sites for power generation.

Federal Clean Water Act (CWA) section 316(b) studies were completed for California's power plants in the early 1980s. In some cases, the Regional Boards have required that these studies be revised. If the new

studies showed that modifications of the intake structures would be effective in reducing impingement and entrainment, the Regional Boards mandated the modifications.

Our experience is that existing technologies for once-through cooling water systems are good at preventing impingement but are poor at preventing entrainment, the effect of which is a challenge to model since the effect concerns impacts on complex biological systems. A parameter that the Central Coast Regional Board has been using for analyzing the effect is the proportional loss of larval productivity caused by entrainment. The proportional loss is determined by comparing the number of larvae entrained to the number of larvae in the source water. The method assumes that larval mortality through the cooling water system is 100 percent and that ecological systems do not compensate for the loss in productivity in a positive way. If this method is used, a once-through cooling water system located in a small bay or harbor will be shown to have a greater impact than a system located in an ocean. Exceptions for ocean intakes may occur when the intake is located in a small cove or an area of highly productive habitat.

California has an environmental review law called the California Environmental Quality Act (CEQA) that requires environmental review for projects, such as power plant modifications. In general, CEQA requires that for each significant impact identified in an environmental impact report (EIR), the EIR must discuss feasible measures to avoid or substantially reduce the project's significant environmental effect. CEQA gives public agencies in California the authority

to require feasible changes in any or all activities involved in a project to substantially lessen or avoid significant effects on the environment. This authority, however, is not unlimited, and there must be a clear nexus between the impact and the proposed mitigation. Under CEQA, the California Energy Commission is the lead agency for review of power plant modifications and has its own environmental review process.

California brought new power plants on line last year, and, at this time, it has enough power generation capacity to meet its energy needs. (These new plants do not have water intakes.) It does not, however, have a surplus of power generation capacity, and some power plants recently approved for construction are not initiating construction because of uncertainty in California's energy markets. Hence, any rule that requires an extended down time for plant modifications in the near future could create energy supply problems in California.

Comments on Proposed Rule

Definition of Existing Phase 11 Facilities

Under the definition in the Proposed Rule, additional units or units that replace existing units would be classified as existing facilities. Although site constraints may prevent the installation of recirculating cooling water towers on these new units, for other upgrades the cost of constructing a recirculating cooling water tower may be equivalent to the cost of constructing a recirculating cooling water tower at a new facility. USEPA should consider this in developing its standards. The issue is whether existing

facilities should always be "grandfathered" into the lower standard of the existing facility rule or whether they should be placed into the higher standard of the new facility rule as existing units are replaced.

Performance Standards

The proposed rule lists performance standards that a power plant must meet. For a power plant that generates more than 15 percent of its maximum capacity, the standards are:

- An 80 to 95 percent reduction in impingement from what would occur if the power plant had no facilities to reduce impingement (i.e., an onshore intake with a trash rack) and

- A 60 to 90 percent reduction in entrainment from what would occur if the power plant had no facilities to reduce entrainment.

The Proposed Rule is unclear as to how to measure the required reduction in impingement and entrainment. Do you measure the reduction by counting the organisms impinged and entrained? Do you weigh the organisms impinged and entrained? If so, do you use dry weight or wet weight? Do you have to measure the reduction for each life stage, or do you lump all life stages together and use a combined count or weight?

The technologies available to meet the required reduction in entrainment are unproven. Table 5-1 in the development document shows three technologies that can meet a 60 to 90 percent reduction in entrainment. These are the Gunderboom aquatic filter barrier, fine mesh travelling screen, and fine mesh

wedgewire screen. The Gunderboom aquatic filter barrier has only been used at one facility; it may be susceptible to biofouling; and it may not work in conditions of heavy currents or wave action. Fine mesh travelling screens have had limited seasonal applications and require frequent maintenance, especially in marine environments.

Wedgewire screens are more suitable for closed-cycle make-up intakes because the large size of the screens limits their applicability.

Because of the uncertainty of the available entrainment reduction technologies, applicants will most likely decide not to install them and instead will request site-specific determinations or will propose restoration measures as an alternative to meeting the performance standards. Otherwise, the owners would risk violating their NPDES permits and being subject to fines and requirements to modify or replace their entrainment reduction facilities.

In situations where once-through cooling is being allowed, SWRCB supports a process in which the applicant is required to evaluate alternative technologies for impingement and entrainment reduction and to select the most effective available technology for the site. This selection would be subject to approval from the permitting authority.

Site Specific Determinations

As an alternative to meeting the performance standards, the Proposed Rule allows a site-specific determination to be made when:

- The cost to comply with the performance standards would be significantly greater than the costs considered by USEPA when developing the performance standards; or

- The costs to comply with the performance standards would be significantly greater than the benefits.

Our experience is that it is difficult to obtain agreement on costs or benefits. The result is a long series of arguments involving dueling cost/benefit analyses. Cost estimates vary widely between estimates generated by the applicant and those generated by independent consultants. Estimates of biological impacts are even more variable, and the applicant often asserts that there will be no net impact. Even if agreement could be obtained on the benefits to a biological community of meeting the performance standards, agreeing on the monetary value on this benefit would still be difficult. If USEPA decides to adopt this portion of the Proposed Rule, we request that the Proposed Rule require the applicant to fund an independent analysis. We also request that "wholly disproportionate" be substituted for "significantly greater" to ensure that site-specific determinations will only be used in unusual circumstances. A rule that requires cost/benefit analyses for most decisions will be difficult to administer.

Restoration Measures

In lieu of or in combination with impingement and entrainment reduction technologies the Proposed Rule allows the use of restoration measures as an

alternative to meeting the performance standards. Under the Proposed Rule, the applicant must demonstrate that the restoration measures will maintain fish and shellfish within the water body, including the community structure and function, to a level comparable to those that will result if the performance measures were met.

Although restoration efforts may create a net benefit, it may be unrealistic to expect the restoration effort to restore the original structures to the aquatic community. A cooling water intake structure will affect each aquatic species differently. Therefore, it may be difficult to demonstrate that the original community structure and function is being maintained.

In cases where the cost of complying with the best technology available requirements would be wholly out of proportion to the benefits, it may be preferable to use a less effective technology combined with restoration measures. The emphasis of the Proposed Rule, however, should be the installation of facilities to minimize impingement and entrainment.

Application Requirements

The Proposed Rule requires the applicant to complete a comprehensive demonstration study at least 180 days before the existing permit expires. As proposed, the comprehensive demonstration study must include:

- A proposal for information collection;
- Source water flow information;

- An impingement and entrainment characterization study;
- A design and construction technology plan;
- Information to support proposed restoration measures;
- Information to support a site-specific determination of best technology available for minimizing adverse environmental impact; and
- A verification monitoring plan.

The proposal for information collection should be submitted at least two years before the submittal of the other portions of the comprehensive demonstration study to allow time to review the proposal and complete necessary monitoring.

For the design and construction technology plan, it is not clear as to how to calculate the baseline rate of impingement and entrainment. Rates for impingement and entrainment are site specific, and the only way to accurately characterize them would be to dismantle the existing technology and to measure the subsequent rate of impingement and entrainment. Since the baseline rates will later be used for the purpose of determining compliance, both applicants and regulatory agencies will probably not find estimated rates based on other sites to be acceptable.

Monitoring Requirements

We have no comments for this section.

Record Keeping Requirements

We have no comments for this section.

Requirements for the Director

We have no comments for this section.

Again, thank you for the opportunity to comment. If you have any questions concerning the comments, please call Stan Martinson, Chief of the Division of Water Quality, SWRCB, at (916) 341-5458 or Gordon Innes, Division of Water Quality, SWRCB, at (916) 341-5517.

Sincerely,

/s/ [illegible] for

Celeste Cantú
Executive Director

Enclosure

CC: Mr. Joe O'Hagan
California Energy Conservation
and Development Commission
1516 Ninth Street
Sacramento, CA 95814

Atlantic States Marine Fisheries Commission
1444 Eye Street, N.W., Sixth Floor
Washington, D.C. 20005
(202) 289-6400 (phone) (202) 289-6051 (fax)
www.asmfc.org

Susan Shipman (GA)
Chair

John V. O'Shea
Executive Director

John I. Nelson (NH)
Vice-Chair

August 7, 2002

Cooling Water Intake Structure (Existing Facilities: Phase II)
Proposed Rule Comment Clerk, W-00-32, Water Docket
Mail Code 4104
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue N.W.
Washington D.C. 20460

Dear Environmental Protection Agency:

The Atlantic States Marine Fisheries Commission appreciates the opportunity to provide comments on the proposed Environmental Protection Agency Section 316(b) regulations under the Clean Water Act. The fifteen Atlantic Coastal States working cooperatively through the Commission collectively manage many of the coastal fishery resources in state waters along the Atlantic coast. Many of these species, including striped bass, sturgeon, shad, river herring, weakfish and flounder have anadromous or estuarine life cycles that rely heavily on rivers and estuaries

along the Atlantic Coast for spawning and nursery areas. Impingement and entrainment of eggs, larvae and juveniles from cooling water intake structures is potentially of great importance to these species and, thus, to the Commission.

The Commission strongly supports the EPA's decision to establish consistent national standards that outline minimum requirements of location, flow, and velocity for existing facilities. This will remove the uncertainty in the existing case-by-case basis approach while still allowing the state permitting authorities to provide additional site-specific measures when the resource requires them. The Commission also supports the EPA's decision to provide greater protection for water bodies with greater biological productivity.

Although the Commission supports the overall approach to these proposed regulations, we have some significant concerns. The EPA has proposed three options for establishing the best technology available for minimizing adverse environmental impacts in the proposed rule. The ASMFC supports the first two but opposes the third option of the facility owner demonstrating that the cost of compliance would be significantly greater than the EPA estimate or value of the benefits. We do not believe that there is enough data available on all of the fish species to fully estimate the cost of impingement and entrainment at each individual facility, nor do we believe that the methods currently proposed fully estimate the value of the key commercial and recreational fisheries or their forage base. In addition, we believe that the EPA has already removed what they believe to be economically infeasible options by choosing not to require dry condenser cooling technology. Currently, most of the

state permitting agencies do not have the appropriate staff to properly evaluate these proposals, and it would increase the permitting work loads and timeframes substantially to necessitate the review of comprehensive cost-benefit analyses. If the EPA does choose to go forward allowing this option the ASMFC urges you to require costs to be "wholly disproportionate" to the costs EPA has considered as you did with the new facilities rule rather that "significantly greater" as has been proposed for this rule.

We also have concerns with allowing restoration measures by a facility in lieu of reductions in impingement mortality and entrainment. While many of the restoration efforts taking place along the Atlantic Coast are beneficial to the species we manage, restoration should not be used in place of technology to reduce impacts. Restoration should only be used when these impacts cannot be avoided or have already occurred. Restoration science is not currently able to recreate the full functional equivalency (the full range, sequence and timing of interdependent life cycle stages that make up a productive, functioning, aquatic community) destroyed through impingement and entrainment. If the EPA does choose to go forward with allowing restoration in lieu of reductions, the ASMFC urges you to require restoration efforts in the same local waterbody where impacts are occurring. In addition facilities should be required to demonstrate that their restoration efforts would achieve a high level of functional equivalency before it is considered as an alternative to reductions in impingement and entrainment.

Thank you for your careful and close attention to the needs of our managed species. Please contact Carrie Selberg, the Habitat Specialist on my staff, if you have any questions.

Sincerely,

/s/ Carrie Selberg / for

John V. O'Shea

[Florida Dept. Industrial Wastewater]

To: Cooling Water Intake Structure (Existing Facilities; Phase II)
Proposed Rule Comment Clerk—W-00-032,
Water Docket,
Room EB57
401 M Street, SW
Washington DC 20460

Electronically Submitted to: ow-docket@epa.gov

Date: August 7, 2002

Subject: Comments on National Pollutant Discharge Elimination System—Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II existing Facilities; Proposed Rule; Published Tuesday, April 9, 2002, Federal Register Volume 67, Number 68

Thank you for the opportunity to comment on the referenced Proposed Rule. We support the Environmental Protection Agency's (EPA) efforts to address the water quality impacts of cooling water intake structures, and recognize the difficulty of developing such a comprehensive rule. The following comments focus on permitting procedural issues and endangered species concerns.

PROCEDURAL PERMITTING ISSUES

The Proposed Rule 40 CFR Part 125.92, Subpart J "When must I comply with this subpart?" states, "You must comply with this subpart when an NPDES

permit containing requirements consistent with this subpart is issued to you."

The language in this subparagraph does not clearly indicate when the Permittee must comply and when the Permitting Authority must require compliance with the rule for the specific regulated community, which consists of existing facilities. The majority of these facilities have held NPDES permits for many years. They are mostly Once-Through Cooling Water (OTCW) systems, and therefore are mostly older facilities. Thus, the overwhelming majority of the NPDES permits in question will be renewals. Does EPA intend that compliance with the rule must be achieved when the next renewal permit is issued following the effective date of the final Phase II rule?

We are concerned that this rule language may lead to inconsistent implementation among the delegated states and EPA Regions, as permit writers and Permittees struggle to understand the intent of the rule. A number of situations which can realistically occur would make the permitting process confusing and uncertain. What if a renewal application is received before the effective date of the final rule, but a permit is not issued by the effective date? What if a Draft Permit is issued just before the effective date, but not a Proposed Permit? What about a Proposed Permit just before the effective date but not a Final Permit? Such cases boil down to a general concern: Permittees need sufficient time to adequately evaluate and implement the means by which they will comply with the rule, and Permit Writers need sufficient guidance from the rule to determine when compliance must be achieved. Each of these cases obviously has the potential to create a situation in which the Permittee (who may have been

operating in good faith and in compliance for many years) can be set at odds with the State and with EPA, potentially delaying renewal and compliance to the detriment of the environment.

Several mechanisms, perhaps in combination, could reduce this sort of implementation crisis. EPA could revise the proposed rule clarifying that facilities which apply for renewal or for their initial permit before the effective date of the Final rule will not be subject to the rule until a specified subsequent date or the next renewal. EPA could revise the proposed rule incorporating a fixed period of time over which facilities can evaluate how they will meet the performance standards or develop site-specific performance standards. Alternatively, a compliance schedule could be incorporated into permits allowing the permittee enough time to come into compliance. In any event, clarification should provide a framework of consistency to guide both Permittees and Permit Writers nationwide.

ENDANGERED SPECIES ISSUES

The Proposed Draft Rule seeks to protect endangered aquatic species by reducing losses due to impingement and entrainment from cooling water intake structures (CWIS) regulated under Phase II. To the extent that this beneficial effect will result from limitations on warm water discharges at once-through cooling water systems, serious harm may result for the Florida manatee, a very important endangered aquatic species in our State's waters. Unlike many other aquatic species, manatees are not impacted by impingement or entrainment from CWIS. On the contrary, manatees find refuge in the warm water discharge areas of some

of Florida's steam electric power plants during cold days in the winter. It is estimated that two-thirds of the Florida manatee population uses these man-made warm water refuges on the coldest days. The situation presents a difficult case study in competing environmental benefits and impacts.

Within the proposed rule, as currently written, we do not find a mechanism for the protection of species that may be adversely impacted by the significant reductions in warm water discharges that will result from implementation of the proposed rule. It is easy to understand how this oversight could have occurred, given the rule's mandated focus on intake structures rather than discharge, the magnitude of EPA's task, and the fact that manatees are uniquely Floridian and Caribbean animals living nowhere else in the United States. Nevertheless, we believe that the proposed rule should be revised to incorporate the flexibility to protect the endangered Florida manatee.

Thank you again for your consideration of our comments.

Allen Hubbard, P.E., Supervisor
Steam Electric Power Plant NPDES Permitting
[Florida Dept. Industrial Wastewater]

cc: Richard Drew
Elsa Potts
Geofrey Mansfield
Steven Wolfe
Jennifer Fitzwater

New York State Department of Environmental Conservation Office of Natural Resources
625 Broadway, Albany, New York 12233-1010
Phone: (518) 402-8560 • **FAX:** (518) 402-9016
Website: www.dec.state.ny.us

[Graphic omitted]
Erin M. Crotty
Commissioner

Cooling Water Intake Structure
Existing Facilities Phase II
Proposed Rule Comment Clerk-W-00-32
Water Docket, Mail Code 4101
EPA Ariel Rios Bldg.
1200 Pennsylvania Ave., NW
Washington, DC 20460

RE: W-00-32 - NYS DEC comments regarding the NPDES Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities

Dear Madam or Sir:

The New York State Department of Environmental Conservation (NYSDEC) is the executive department of the State of New York having primary responsibility for administration, permitting, and enforcement of State environmental protection laws, including water pollution control and water utilization laws and laws regulating fish and wildlife resources. NYSDEC is the agency to which EPA has approved to administer State NPDES permits under the Clean Water Act. As such, our Commissioner or her designee serves as the state

"Director" in deciding the conditions and implementing regulations in our State Pollutant Discharge Elimination System (SPDES) Permits, and in implementing the proposed regulations regarding cooling water intake systems for which EPA is soliciting comments. Following are our Department's major comments on the proposed regulations. As you will see, we support some provisions of the proposed rule, oppose others, and offer suggestions. We have arranged our comments by topic.

1. General Statements of Support - We fully support many of the provisions of EPA's overall approach. Specifically:

a. We support the promulgation of nationally-applicable minimum standards. This ensures fair competition among generators and other facilities with cooling water intake structures both across and within states.

b. We support the provisions which afford the generator flexibility in selecting the technology or operational measures that reduce impingement mortality and entrainment.

c. We support the proposal for a theoretical baseline impact to be calculated as a shoreline intake with no impingement/entrainment controls. This would fairly credit existing facilities for the mitigative measures they implemented prior to the effective date of the proposed regulations.

d. We support these Phase II rules (with the changes recommended below) because, on a national basis, they affect 57 per cent of existing

power generating stations and 99.04 per cent of the total flow withdrawn by existing steam-electric power generating facilities.

e. We support and agree with EPA's recognition that the primary focus for Phase II performance standards for existing facilities is the goal of reducing specifically aquatic impacts, and fish mortality.

2. New York's Preferred Alternative - We prefer your "Impingement Mortality and Entrainment Controls Everywhere" (as presented on pages 17158-17159 in Section VI(B)(4)) alternative to EPA's Preferred Alternative. We strongly recommend that EPA adopt this alternative because it "levels the playing field" for all generating companies and because it offers flexibility. The generators would be fully aware of what is required to meet the performance requirements of proposed Section 125.94(b)(3). EPA would establish the required level of performance but generators would be free to select any or a combination of techniques to achieve the performance level. This is the simplest alternative to implement and your analysis found that it provides the highest benefit to cost ratio (3.74:1). An additional advantage is that companies and regulators could put their staff and monetary resources into reducing impacts instead of into studies and rebuttals. This alternative also responds to what EPA has asked comment on: the 'extreme burden' on State agencies which cost/benefit and site specific determinations have imposed, over these past years on state agencies. Finally, we agree with EPA's statement that "This alternative would establish clear performance-based requirements that

are simpler and easier to implement than those proposed and are based on the use of available technologies to reduce adverse environmental impact. Such an alternative would be consistent with the focus on use of best technology required under Section 316(b)."

3. EPA's Preferred Alternative - While parts of "EPA's Preferred Alternative" have very positive elements, we see a number of potentially serious problems. As proposed, a facility would select one of three different Methods to establish the best technology available (BTA) for minimizing adverse environmental impact:

Method 1. The facility owner demonstrates compliance with the new rules.

Method 2. The facility owner implements additional technologies, and operational or restoration measures.

Method 3. The facility owner demonstrates that the cost of compliance would be significantly greater than either the EPA estimate of costs, or the site-specific value of the benefits.

a. Our support for many of these provisions and our suggestions for improvement are as follows:

1. Method 1 is straightforward and we support it. Closed-cycle recirculating facilities would be deemed in compliance. For purposes of regulatory and scientific certainty, a demonstration of compliance

at other facilities should require at least one year of impingement and entrainment study in order to document compliance. We recommend that additional studies be conducted at least one year in each five year permit term (except for facilities equipped with closed cycle systems) to verify compliance.

2. We support the concept in Method 2 of reducing impacts by adding technology and measuring the results against the standard. We believe, though, that the sampling proposed is insufficient and would yield erroneous or incomplete results. We recommend that collections for impingement should be performed for a 24-hour period at lease once per week for 52 consecutive weeks. Collections for entrainment should be performed at intervals no greater than 6 hours apart over a 24-hour period at least once per week though periods when spawning occurs in the affected water body. Method 2 appears to require that, at a minimum, an impingement and entrainment monitoring program be conducted "before" and "after" mitigative measures have been implemented to determine levels of impact. We support the proposed components of a "Comprehensive Demonstration Study" to be conducted for existing facilities. Finally, as with Method 1, we suggest that facilities be required to reevaluate impingement and entrainment impacts

during one year of each five-year permit period.

3. We support the different thresholds of protection for different water bodies, as EPA has proposed, and the flexibility for a Director to select a level of protection within a finite range. We agree with the proposed target ranges of reducing impingement mortality by 80 to 95 per cent, and entrainment by 60 to 90 per cent; this approach recognizes that levels achievable from closed cycle cooling vary depending on the salinity of the waterbody.

b. Our concern is greatest with Method 3. We believe it could effectively negate the value of the entire Phase 11 rule; our thoughts are as follows:

1. Lowering the standard from "costs wholly disproportionate to benefits" to the much less stringent "costs significantly greater than site specific benefits" is unacceptably problematic. The former criterion has been applied to these Phase II and all other facilities since the 1970's and is supported by a substantial body of case law, permit decisions and legal opinions.

2. State fish and wildlife resources would be at risk if the lower standard were used; in New York, the aquatic organisms impacted by plant intakes belong to the State (Environmental Conservation Law

§11-0105). Rather than the widely-accepted "polluter pays" approach, the EPA-proposed rule weighs a polluter's cost against a monetized value of fish and wildlife resources it does not own and to which it has no entitlement.

3. The value or "benefit" of State fish and wildlife resources is difficult to quantify. Whereas the costs of mitigative measures are easy to quantify using familiar accounting techniques, the task of placing an accurate dollar value on aquatic resource impacts is rife with ecological and economic challenges; there is no widely-accepted methodology. In contrast, by maintaining the conventional "costs wholly disproportionate to benefits" analysis, generators would have to look at the incremental cost of controls in light of the dollars they make selling electricity.

4. Method 3 would generate numerous studies which could impose a substantial review burden on state agencies. As cited in your discussion, Salem Nuclear Generating Station's permit application comprised 36 volumes supported by 137 additional volumes of technical and reference materials. Clearly, a significant effort would be required to meaningfully scrutinize so much information. Furthermore, state water quality and natural resource agencies would frequently need to retain the specialized

expertise needed for review of the more arcane studies. Once again, EPA recognizes this extreme burden and we agree.

5. Method 3 appears to provide an unfair competitive advantage to old, inefficient, high impact facilities. In the competitive wholesale electric power market if a biased cost/benefit analysis would enable a facility avoid or reduce the costs needed to achieve standards, it could sell its electricity more cheaply than newer, more efficient, compliant facilities that have internalized the cost of impingement and entrainment protection. This market advantage could be a strong disincentive to comply under Method 1 or Method 2, and would penalize new power plants regulated under the Phase I rule. Such an outcome would not serve the purposes of the Clean Water Act, nor would it serve the interests of cleaner air and more efficient use of fossil fuels. Plants that cannot satisfy Method 1 or Method 2 should be: 1) repowered to modern technology; 2) decommissioned as having outlived their usefulness; or 3) operated at less than EPA's proposed 15 per cent capacity to qualify for that exemption.

6. We are also concerned about the provision in EPA's Preferred Alternative (described in Method 2, as well) that would allow for restoration in lieu of controls to avoid and minimize

impingement and entrainment impacts. We believe that restoration is appropriate only within the widely-used stepwise approach whereby every effort is made to first avoid and then minimize impacts through technology-based measures on intake design, location, construction, and capacity. Restoration should be used only to address truly unavoidable impacts.

7. "Restoration" includes habitat creation, habitat restoration, or stocking organisms. Any approved restoration plan should be designed to promote natural propagation and survival of indigenous species which have been impacted by plant operations. In addition, restoration should be viewed as a temporary measure to allow the facility to continue to operate until suitable in-plant solutions can be devised or the facility is decommissioned.

Stocking to replace organisms killed or injured should be avoided. First, the aquatic resource diversity is high. In the case of New York's Hudson River, for example, more than 100 species are at risk to power plant intakes. Also, artificial propagation is difficult. Our experience with a striped bass hatchery on the Hudson River is that it never reached its target level of production, and the target was still a small fraction of the striped bass killed by plant intakes.

Further confounding issues are genetics, disease, and intraspecific competition with naturally-spawned fish.

Finally, there are practical limitations to restoration, too. In many systems, the space and/or hydrology are unavailable for meaningful restoration. Creating another Hudson River or another Great Lake would be impracticable.

4. Site-Specific Alternative - We do not endorse "site-specific alternative" approaches as defined in the proposed rule, especially the one proposed by UWAG (the Utility Water Act Group). We believe it would cancel the benefit of having a national standard; it appears to offer less protection than the 1977 draft guidance in current use. The intensity of sampling and study necessary to detect a 1 per cent or 5 per cent population change with certainty, and to be able to attribute that impact to an individual plant, would be exceedingly costly and perhaps technically impossible in most instances.

We also disagree with the definition of "adverse environmental impact" as proposed by UWAG. We consider any impingement or entrainment to constitute an adverse environmental impact. Considering impacts only when they can be observed on a population level could allow irreversible damages to fish stocks. We do support the "Alternative Definition" as presented at (2) on Page 17163 because it considers numerous components of an aquatic community.

5. Dry Cooling - Although dry cooling may be the best technology at some facilities, we agree that retrofitting all existing plants with dry cooling should not be the standard because of 1) the massive cost and loss of efficiency in converting water-cooled plants to dry cooling, and 2) the other non-aquatic environmental impacts that dry cooling technology can impose.

6. Performance Level - We agree that the equivalent of "closed-cycle cooling everywhere" as defined in the proposed rule should not be the standard. The levels of performance are comparable to those we impose. The range of levels permits a wider variety of systems to be used, and would have a lesser impact on electric generation, especially in tidal rivers, estuaries, bays, and oceans.

7. Capacity Factor - We support EPA's proposed exemption for facilities with low capacity but have two reservations; we are concerned that the 15 per cent capacity (55 days per year) factor exemption threshold is too high. First, the time of year the plant is running could coincide with a peak impingement or entrainment period. For example, in New York City, peak capacity is usually needed during the summer; this is when bay anchovy, an important forage species, spawns. Data suggest that 55 days of operation in July or August could entrain very significant proportions of larval and juvenile anchovy populations.

We have a similar concern at facilities with multiple generating units. Since each unit can operate independently, there is a potential for significant impacts resulting from this exemption. A facility with several obsolete units that seldom run and one

efficient, newer unit that runs a high percentage of the time could qualify for this 15 per cent capacity factor exemption. As above, this circumstance would pose a problem if the high-use unit were operating during the peak impingement/entrainment season. In any case, the total capacity for a facility should only be based upon those units that have valid air emission permits and valid NPDES or SPDES permits.

8. Freshwater Rivers - We support EPA's proposal that on fresh water rivers, facilities that use 5 per cent or less of the mean annual flow would have to reduce impingement mortality, but not entrainment, and those using more than 5 per cent would have to reduce both. We feel that this criterion should not be any larger than 5 per cent for the exclusion from entrainment protection. On one New York river we examined, 5 per cent of mean annual flow equated to approximately 25 per cent of median August flow, with August being our average low-flow month. Thus, this level is still a substantial proportion of the river's flow in low flow months, and would be an even higher proportion in dry years. In such dry years a facility with coarse screens would entrain a greater percentage of small fish.

9. Mortality Credits - We have concerns about the concept of trading fish and wildlife mortality credits among facilities. First, we do not support trading mortality credits on a national basis. Such a system would appear to violate state sovereign rights over fish and wildlife resources and would compromise our capacity to manage these resources. Also, we do not support trading based on the biomass of the organisms killed. For example, the loss of a two-pound common

bullhead cannot be compared in any meaningful way to the loss of two pounds of endangered short-nosed sturgeon eggs or fry. In addition to the huge difference in the number of organisms per unit of weight, these species vary markedly with respect to survival rates, mean age of reproduction, narrowness of habitat requirements, abundance, and susceptibility to extirpation.

We would welcome an opportunity to discuss the proposed rules with you and regulatory agency representatives from other states prior to the promulgation of the final regulations. This would afford an opportunity to better explain or elaborate on these points. Also, in light of your willingness to provide ample opportunity for comment, we may be providing under separate cover supplemental comments and appendices that provide elaboration and substantiation on key points as well as responses to many of the "EPA requests comments on..." statements throughout the Proposed Phase II rule. If you have questions or a need to discuss this issue further, please contact Mr. Steven Jay Sanford, Chief, Bureau of Habitat at 518-402-8996, sxsanfor@gw.dec.state.ny.us. Thank you for the opportunity to comment and for your consideration of our views.

Sincerely,

/s/

Peter S. Duncan
Deputy Commissioner
Office of Natural Resources

cc: S. Sanford

Frank Ackerman, PhD and Rachel Massey, MPA, MSc[1]
Global Development and Environment Institute
Cabot Center
Tufts University
Medford, MA 02155

Cooling Water Intake Structure (Existing Facilities: Phase II)
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue N.W.
Washington D.C. 20460

Re: Comments on Notice of Data Availability, EPA 40 CFR Part 125
Clean Water Act §316(b) — National Pollutant Discharge Elimination System — Proposed Regulations for Cooling Water Intake Structures at Phase II Existing Facilities; Notice of Data Availability, March 19, 2003.

Dear Sir/Madam:

We are pleased to have the opportunity to submit comments on the above-captioned notice of data availability. As we discuss below, in our view cost-benefit analysis is an inappropriate tool for adjudicating the policy questions currently facing the Agency. However, even if one accepts cost-benefit analysis as an appropriate means to determine the

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[1] Frank Ackerman is Research Director, and Rachel Massey is a Research Associate, at the Global Development and Environment Institute, Tufts University. These comments are not being submitted in an official capacity at Tufts University. They are being submitted on behalf of Riverkeeper.

appropriate level of regulation for power plant cooling water intake systems, the magnitude of the omissions in the NODA renders the exercise meaningless. The difficulties encountered in the attempt at monetization of benefits underscore the need for other approaches to evaluation of policy options.

As we discuss in detail below, despite the large amount of analysis that went into the NODA, the document includes only a fraction of the data that EPA itself considers to be relevant for the regulation. Having discarded the approach to nationwide calculations it used for the original proposed ruling, in the NODA the Agency presents benefit calculations for just two regions of the country. Calculation of both use and nonuse benefits is attempted for only one of the two regions; and even this calculation omits consideration of key biological facts.

The lack of key information in the NODA does not reflect lack of effort in gathering and analyzing data. Rather, the shortcomings of the NODA illustrate the flaws in the methodology that EPA is now pursuing. The task of quantifying benefits will require significant further analysis, and involves methodological quandaries that will not be resolved easily. In our opinion, by converting its regulatory mandate into a lengthy and methodologically questionable program of data collection and analysis, EPA has failed to meet its responsibilities under the Clean Water Act. The Agency has, however, developed a substantial body of data and background information. These data can be applied usefully to developing sound regulations, which should take account of benefits without holding them to the unrealistic standard of precise monetization, as the Agency has done thus far.

1. Background

EPA's original proposed rule calculated estimated costs and benefits for seven possible regulatory options: a waterbody/capacity-based option with two possible tracks; the proposed rule, with "alternative less stringent requirements based on both costs and benefits"; impingement mortality and entrainment controls everywhere; all cooling towers; a dry cooling option; and a waterbody-based option. According to EPA's analysis, net benefits were positive for four of the options examined; they were negative for the "all cooling towers" and "dry cooling" options, and were not costed for the "waterbody-based option." EPA's calculated net benefits were highest, by a small margin, for the "proposed option." For another option, which would have placed more stringent controls on cooling water intake systems, estimated net benefits were more than 99% of the estimated net benefits of the proposed option.[2]

In our comments on EPA's original draft ruling,[3] we presented a number of criticisms. We pointed out that EPA's estimation of net benefits was seriously flawed, and that even conservative adjustments to account for some of EPA's omissions would produce significantly higher benefit figures, and would imply that a different regulatory option had the highest net

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[2] See 316(b) Phase II EBA, Part D: National Benefit-Cost Analysis, Chapter D1: Comparison of National Costs and Benefits. Available at http://www.epa.gov/waterscience/316b/econbenefits/d1.pdf, visited May 2003. Estimated net benefits for the proposed rule were $452 million, while estimated net benefits for the "Impingement Mortality and Entrainment Controls Everywhere" option were $449 million.

[3] Comments submitted by Frank Ackerman, August 1, 2002.

benefits. In particular, we noted that EPA's use of an outdated "rule of thumb" for calculating nonuse value was misleading, and lacking in theoretical or empirical justification.

We noted that EPA had effectively valued large portions of aquatic resources at zero. One striking omission was the failure to place any value on the unharvested fish that regenerate the population from year to year. We also expressed concern that EPA overlooked important sources of value, ranging from commercial value of shellfish through ecological, recreational, and nonuse value of aquatic flora, bird life, and other organisms. We found EPA's consideration of threatened and endangered species to be a worthwhile, but limited, first step toward an analysis of this topic. We supported EPA's efforts to develop "habitat replacement cost" (HRC) as a methodology for developing more complete and accurate benefits estimates, but cautioned that this methodology requires a level of biological information that is often unavailable.

2. What Changed in the NODA?

The NODA includes a number of adjustments in EPA's methodology. Some of these adjustments respond directly to our criticisms of the original analysis. However, additional methodological problems introduced in the NODA make it difficult to draw clear conclusions about whether EPA's analysis has, on balance, improved.

Important new elements that appear in the NODA include abandoning the outdated "rule of thumb" according to which nonuse benefits were formerly calculated as 50% of recreational use benefits;

acknowledging the nonzero value of unlanded fish; and grouping several previously distinct categories of value together in a new "nonuse" category. However, there are also methodological setbacks, where EPA retreats from desirable features of its earlier analysis. For instance, EPA abandons the "Habitat Replacement Cost" method of estimating total ecosystem value; gives little indication of how it expects to calculate use benefits in six of the eight regions or nonuse benefits in seven of the eight regions; and does not attempt any calculation of the value of threatened and endangered species lost to impingement and entrainment in the NODA.

Due to these and other limitations, it is difficult to evaluate the changes in EPA's methodology represented in the NODA. In the absence of a completed national benefits analysis, it is not clear how benefits will be calculated for each region and for the country as a whole. For example, is EPA planning to perform analyses for all eight regions, comparable to the NODA estimates for the North Atlantic? If not, what method of extrapolation will be used to scale regional estimates up to a national total? Within regions, what methods will be used to scale estimates for individual plants up to regional totals? The reclassification of power plants, from waterbody-based categories in the original analysis to regional groupings in the NODA, means that category totals from the two analyses cannot be directly compared.

Despite these difficulties, we have made an approximate comparison of the NODA to the Economic Benefits Analysis (EBA) performed by EPA last year, by looking at the three plants in the North Atlantic region, Brayton, Pilgrim, and Seabrook, that were

included in EPA's case studies for the EBA. We have compared the case study benefits for these three plants to the NODA benefits for the North Atlantic region as a whole, as shown in Table 1 (next page), using the average of high and low case benefit estimates throughout.

When benefits are expressed as dollars per cubic foot/second (cfs) of water flow, the North Atlantic regional benefits are now estimated at roughly $9,000 per cfs of flow. Since most of the region's plants (all but Pilgrim and Seabrook, in fact) are located on estuaries, the closest comparison may be to Brayton, the one North Atlantic estuary plant analyzed in the case studies. The benefit estimate for Brayton amounts to $10,350 per cfs, which is broadly comparable to the NODA value for the region as a whole. Thus we would guess, from the limited information available, that the NODA calculations introduce little change in aggregate estimated benefits. If this is the case, then the effort required to develop and implement the NODA methodology has little impact on the bottom line evaluation of policy options. While some problems in the analysis have been fixed from last year, other problems have been introduced. We showed last year that reasonable adjustments to the EBA methodology would produce much larger benefit estimates; we will demonstrate below that reasonable adjustments to the NODA methodology would likewise produce much larger benefit estimates for the North Atlantic, and thus presumably for the nation as a whole.

Table 1. Benefits/flow, North Atlantic region

	Average of high and low case benefits	Water flow (cubic ft/sec)	Benefits/ flow
NODA North Atlantic - no discounting	$111,140,000	11,897	$9,342
NODA North Atlantic - 3% discount rate	$110,660,000	11,897	$9,302
NODA North Atlantic - 7% discount rate	$110,230,000	11,897	$9,265
Case study - Brayton	$16,001,276	1,546	$10,350
Case study - Pilgrim	$9,786,000	691	$14,162
Case study - Seabrook	$344,602	896	$385

Water flow data from Pisces Conservation Ltd., from Form EIA-767.

Water flow data was not included for a few of the smaller plants in the NODA North Atlantic region.

3. NODA Benefits Analysis: Methodological Problems

In the NODA, EPA significantly revises the methodology it uses to calculate the expected benefits of the proposed ruling. However, the NODA includes only a fraction of the information that EPA itself considers to be relevant for the regulation. In our view, EPA has failed to develop a credible estimate of the benefits of the proposed regulation.

Our discussion of the NODA benefits analysis begins with issues of regional disaggregation and the role of meta-analysis. We then turn to the North Atlantic benefits estimates, where we focus on the missing categories of use value, the limited number of species included in the nonuse value analysis, and the geographical coverage of the nonuse value. Finally, we review some of the important categories of ecosystem value that are excluded from the NODA.

Among other points, we note that EPA's nonuse valuation of fish affected in the Peconic Bay estuary is highly incomplete; EPA inappropriately limits the geographic scope of its nonuse benefits analysis; and the NODA fails to consider key biological facts, including interdependence among species and precarious stock status for many populations. Minimal requirements for completing the analysis EPA has begun should include developing a use value for unharvested fish and completing the meta-analysis of existing studies on nonuse value. In addition, EPA must avoid placing an effective value of zero on categories of value the Agency does not have time or resources to analyze in detail.

Regional disaggregation and meta-analysis. In the NODA, EPA discards its previous system of categorizing power plants by water body type, and instead divides the country into eight regions. The level of detail provided for the North Atlantic region, and for the partial analysis of Northern California, together with the absence of any nationwide generalizations or extrapolations from this data, suggests that most data must be developed separately for each of the eight regions. However, EPA considers only two regions in the NODA: the North Atlantic region and the Northern California region. Furthermore, EPA attempts a full accounting of benefits for the North Atlantic region only; for the Northern California region, EPA has not yet looked at nonuse benefits.

One of the areas that required substantial, and creative, analytical effort in the NODA was the estimation of nonuse values for the North Atlantic region, a topic we discuss below. Unfortunately, the disaggregated NODA methodology suggests that a new analysis at this level of complexity needs to be done seven more times, once for each region. EPA's analysis suggests, though it never states explicitly, that nonuse values must be estimated on a locally specific basis. However, sufficient data may not be available for some regions; will nonuse values be declared to be zero for such regions? On a deeper level, the need for region-specific nonuse studies reflects the dubious assumption (discussed below) that nonuse values are only important in the immediate vicinity of the affected ecosystems. On the more reasonable assumption that nonuse values apply over much wider areas, it would be appropriate to develop a common

national methodology to supplement the regional approach.

One way to develop such a methodology is to conduct a meta-analysis of the numerous existing studies of nonuse values. Meta-analysis is a well-established research technique, used in many scientific and economic analyses to evaluate and combine the body of data and results contained in a range of similar studies; the expanded database allows researchers to develop greater confidence and precision in their results. EPA began, but did not complete, a meta-analysis of nonuse values of water resources for use in this case. We recommend that EPA complete that meta-analysis, and use it to support and contextualize national projections of nonuse value. The raw data provided by EPA, from its initial work on the meta-analysis, makes it clear that substantial nonuse values for water resources have been estimated, in several regions of the country.[4] In addition, studies in other contexts consistently support the view that Americans place a high nonuse value on natural resources. Annual willingness-to-pay values for highly visible animals such as bald eagles, humpback whales, and gray wolves add up into the tens of billions; the existence of a less famous endangered species, the striped shiner, is reportedly worth an average of $6 per household per year to the American public, or more than $600 million annually on a nationwide basis.[5] The clear lesson of

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[4] Tudor, et al., "Comparison of Non-use and Use Values from Surface Water Valuation Studies," Memo to the 316(b) Record (DCN 5-1011), March 12, 2003, Appendix A.

[5] John B. Loomis and Douglas S. White, "Economic Benefits of Rare and Endangered Species: Summary and Meta-analysis",

these studies is that nonuse values are substantial; thus, for a benefits analysis to be complete, nonuse values must be estimated for all the affected organisms.

North Atlantic benefits – use values. For more detailed comments on the NODA benefit estimates, we now turn to the North Atlantic regional benefits, the only complete benefits analysis offered in the NODA. The benefits, as estimated in the NODA, consist of commercial use values, recreational use values, and nonuse values. While commercial and recreational benefits are of great importance, they are not the only use values that could and should be estimated.

Another category was omitted in both the earlier analysis and the NODA, namely the use value of the "unlanded" fraction of I&E losses. Estimates of commercial and recreational values are based only on the fraction of fish lost to I&E that would have been caught ("landed") in the absence of cooling water withdrawals. Normally only a small fraction of fish, even of the most valuable species, are caught by commercial and recreational fishing each year. In other words, most of the fish lost to I&E would have survived – and therefore are not included in estimates of either commercial or recreational value. The unlanded fish not only survive, but also reproduce, creating the fish that will be caught in future years. In effect, they are the natural capital of the fishing industry, analogous to the capital goods that are used in manufacturing.

Ecological Economics 18 (1996), 197-206; values from Table 1, p. 199.

species, accounting for more than half of the region's I&E losses.

Of the 13 fish species for which wetland and SAV restoration could be relevant, EPA was able to obtain sufficient information to proceed with the analysis for just six species: winter flounder, Atlantic silverside, and striped killifish as candidates for benefiting from wetland restoration, and threespine stickleback, northern pipefish, and scup for SAV restoration. EPA had no data on production rates in the relevant habitats even for these species, so the Agency estimated densities per acre based on abundance data. No abundance data were gathered for the remainder of the 13 species, which include some of the best-known and most valuable ones: American sand lance, grubby, striped bass, bluefish, Atlantic cod, weakfish, and pollock.[8]

In summary, in the attempt to generate data on the nonuse value of the fish lost to I&E in the North Atlantic region – losses that include at least 37 species – EPA estimated the relationship between acreage of two habitat types and likely density of just six fish species. EPA conducted no analysis whatsoever for the other affected species, even though well-known species such as striped bass, bluefish, and Atlantic cod are likely to have substantial nonuse values.

Having estimated area requirements for three species per habitat type (three for wetlands and three for SAV), EPA bases its final analysis on the species that, of each set of three, have the highest area requirements for regeneration. EPA expresses

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[8] *Ibid.*, p.4.

concern that this overstates the acreage required for the other two species for which calculations (in the same habitat type) have been done. But the greater concern is the potential understatement of requirements: there is no way of knowing whether EPA's calculation accurately represents the requirements for regeneration of the seven other species for which wetlands and SAV are relevant; and it explicitly does not include the other 24 species identified in the region's I&E mortality data, ones that cannot be regenerated by these habitats. Nor, of course, does EPA's analysis attempt to measure the value of losses of nonfish species, such as shellfish or smaller, but nevertheless vital, components of the aquatic food web.

Given these large omissions, EPA should, at the very least, state what percentage of total nonuse value for the region it has analyzed and multiply its results by a corresponding factor. For example, does the nonuse value calculated for the Peconic Bay estuary represent an appropriate value for 6 out of 37 species, or about one-sixth of the species identified in I&E loss data? It may be difficult for the Agency to estimate what fraction of the affected fish it has accounted for in its analysis, but if the Agency fails to factor in those it has not accounted for, it has, once again, effectively placed a value of zero on many affected organisms.

North Atlantic benefits – geographical scope of nonuse benefits. EPA then converted estimates of required habitat areas into dollar values on the basis of a survey in which people were asked how much they value wetlands and SAV. The researchers did not tell respondents which fish the wetlands and SAV were expected to regenerate, so responses presumably

reflect respondents' general impressions about fish populations, rather than values placed on individual species.

EPA examines two overlapping populations that may place a nonuse value on the aquatic resources of the North Atlantic region — the 3.65 million households located in the counties abutting affected water bodies, and the 4.2 million households living within a 32.4 mile radius of the affected water bodies. The Agency develops both total and per-household value estimates for each of these areas. Using the households in abutting counties, EPA calculates "a total WTP to reduce impingement and entrainment losses of $4.07 to $7.83 and non-use WTP of $3.44 to $6.52 per household residing in the counties abutting affected water bodies." Using the larger area, with the 32.4-mile radius, EPA finds that "implied WTP values to reduce all I&E losses range from $5.63 to $23.43 and non-use WTP range from $5.61 to $21.83 per household residing in the 32.4 mile-radius area."[9]

It is well known that people living a significant distance from a resource can still value that resource. For example, people throughout the US placed a substantial nonuse value on the ecosystems damaged by the Exxon Valdez oil spill — even though Prince William Sound was hardly a household word before the spill occurred.[10] The Grand Canyon has a powerful meaning to people who live outside Arizona; Yellowstone is important to people who live far from

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[9] NODA, p. 13574-5.

[10] See Richard T. Carson et al., Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez, Report Submitted to the Alaska Attorney General (Nov. 1992).

Wyoming. There is no reason to think that the aquatic resources of the North Atlantic region are an exception to this pattern. Indeed, both the Atlantic and the Pacific coasts of the US are generally considered to be a national resource and birthright. Schoolchildren across the country — not just in coastal communities — sing about "America the beautiful" stretching "from sea to shining sea." All of this suggests that Americans across the country place a nonuse value on coastal ecosystems.

A model for the analysis of nationwide nonuse values for a local resource can be found in the early work of Robert Stavins. It provides an interesting contrast to his recent criticism of EPA's treatment of nonuse value (and his criticism of our earlier comments on the subject). In 1984 Stavins was the principal author of a cost-benefit analysis of a proposed hydroelectric development on the Tuolumne River, in California.[11] The analysis, which showed that the benefits of development were less than the costs, helped to defeat the proposed dam and to preserve the river in its natural state for recreation. The nonuse benefits of preserving the river were crucial to Stavins' analysis; without those benefits, his calculations would have strongly favored development.

Stavins argued that it was not surprising that the nonuse value of the Tuolumne was large:

> In the case of environmental resources, the so-called nonuser or intrinsic benefits may

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11 "The Tuolumne River: Preservation or Development? An Economic Assessment," Environmental Defense Fund, Berkeley CA, March 1984; hereafter cited as "Tuolumne River."

> represent a substantial portion of the resources' total value.[12]

He employed a ratio of nonuse to use value, derived from other published studies, to estimate the per-capita nonuser value. Stavins' next step was to multiply the per-capita nonuser value "by an estimate of the number of people *in various regions of the country* who are likely to" assign a nonuse value to the resource.[13] His estimate of the number of "interested nonusers," as he called them, was the entire California membership of the Sierra Club (some of whom lived hundreds of miles away from the Tuolumne), plus half of the membership of the Sierra Club in the other 49 states. His calculations assigned a sizeable nonuse value to each of these individuals, even those who lived across the continent from the Tuolumne.

Alternatively, he discussed public opinion surveys suggesting that 40% of the US population feels strongly about the preservation of wilderness, and pointed out that his total nonuser benefit estimate could also be the result of 40% of the US population having a willingness to pay to preserve the Tuolumne of just $0.33 per person per year. After calling for more research to determine the nonuse value more directly, he concluded that

> In the meanwhile, however, these estimates represent, at the very least, a reasonable first approximation ... [nonuse value] is too important to be ignored.[14]

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[12] "Tuolumne River," 158.

[13] "Tuolumne River, "161, emphasis added.

[14] "Tuolumne River," 163.

Following the example of Stavins' early work, we recommend that EPA reconsider its restriction of nonuse value to the population living very close to the plants in question. Suppose, for instance, one accepted EPA's nonuse value for the population in bordering countries, and also assumed that the use value per household in the rest of the country is even 10% as high as in the bordering counties (or alternatively, one could assume that 10% of the households in the rest of the country have a non-use value as high as those in the bordering counties).[15]

There were 106.3 million households in the United States in 2001.[16] Of these, 3.7 million lived in the counties bordering the North Atlantic facilities in question, and 102.6 million lived elsewhere. According to the NODA, the nonuse WTP to eliminate all I&E losses was $20.73 to $33.97 per household in the bordering counties.[17] Thus, our 10% assumption implies that the nonuse WTP for the 102.6 million households in the rest of the country was $2.07 to $3.40 per household; this implies a total nonuse WTP, beyond the bordering counties, of $212.4 to $348.8 million. As shown in Table 2, this adjustment more than triples the total value of baseline losses due to North Atlantic I&E.

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[15] A similar calculation could be done using EPA's estimates for households within a 32.4 mile radius. The result would be even larger total values than the ones we derive here.

[16] This is the number of occupied housing units, from American Housing Survey 2001, Table 1A-1, available at http://www.census.gov/hhes/www/housing/ahs/ahs01/tab1a1.html.

[17] NODA, p.13574.

Table 2. Value of North Atlantic Baseline Losses

(millions of 2002 dollars)

	Lower bound	Upper bound
Bordering counties - use and nonuse values	79.2	148.2
Rest of country - nonuse value	212.4	348.8
Total	**291.6**	**497.0**

Bordering counties data from NODA Table X-42.
Rest of country data explained in text.

As Stavins accurately observed in 1984, the effect of nationwide nonuse value is too important to be ignored.

Ecosystem values omitted from the NODA. As in EPA's earlier analysis, the NODA omits important categories of ecosystem value — many of them acknowledged and listed by EPA itself. Thus the calculation of benefits of reduced cooling water take is necessarily incomplete; even if EPA had completed a cost-benefit analysis along the lines of the NODA, a comparison of complete costs with such incomplete benefits would be of little value in evaluating public policy options.

EPA notes that it has no information on the stock status of many of the species affected by I&E. For the North Atlantic region, EPA reviews the information available on stock status of 25 stocks (15 species) of groundfish, noting whether a given stock is "subject to overfishing (the harvest rate exceeds threshold)" or "overfished (stock size is below threshold)." Of these

25 stocks, fully 15 are categorized as "currently subject to overfishing," "overfished," "approaching an overfished condition," and/or "in an unknown condition with regard to overfishing."[18]

Thus, more than half of the groundfish stocks considered are in a condition such that, as far as EPA knows, further I&E losses could conceivably drive the population down to zero. While this will presumably not occur for all the listed stocks, a complete quantification of the baseline losses should include the possibility that a given stock of precarious (or unknown) status could be destroyed by continued I&E. Just as cost estimates include the possible shutdown of plants subject to regulation, benefit calculations should include some calculation of the probability that a population will collapse.

To be complete, a benefits analysis should consider all the organisms harmed by I&E losses. Like the analysis conducted for the original ruling, however, the NODA includes no attempt to quantify the value of damage inflicted on birds, or on fish-eating mammals. The NODA also does not look at ecosystem services provided by other organisms likely to be affected by I&E, such as small invertebrates. According to the scientists at Pisces Conservation, important services provided by aquatic ecosystems as a whole include recycling of human waste in waters close to human habitation; demobilization and detoxification of chemical waste products; stabilization and accumulation of sediments, preventing soft sediments from producing turbidity and sedimentation of channels; and support to terrestrial ecosystems

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[18] NODA, p. 13549.

(including exportation of biomass from water to the land via invertebrates, birds, and mammals).[19]

EPA gives some attention in the NODA to non-fish species such as lobsters and shellfish, but does not explore fully the range of possibility for these species. For example, EPA discusses the high-value lobster fishery of the North Atlantic region and notes that this fishery is currently subject to severe overfishing. However, EPA does not appear to factor into its analysis the possibility that the lobster fishery could collapse due to continued combined pressure from harvesting and from I&E losses. EPA notes that "the Northeast lobster fishery is second in commercial value after the multispecies groundfish fishery,"[20] so the Agency's decisions about how to analyze this population's fate are significant.

By its own admission, EPA consistently underestimates the number of fish lost to I&E.[21] Many

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[19] Pisces Conservation, Ltd., Technical Evaluation of US Environmental Protection Agency's Proposed Phase II Cooling Water Intake Regulation for Existing Facilities (including Comments on NODA), June 2003.

[20] NODA, p. 13550.

[21] See 316(b) Phase II Economic Benefits Analysis, Part C: National Benefits, Chapter C1: Case Study Introduction, Section C1-5.1: Data Limitations. Available at http://www.epa.gov/waterscience/316b/econbenefits/c1.pdf. EPA notes: "EPA's analysis is based on facility-provided biological monitoring data. These facility-furnished data typically focus on a subset of the fish species impacted by I&E, resulting in an underestimate of the total magnitude of losses.... The facility-derived biological monitoring data often pertain to conditions existing many years ago (e.g., the available biological monitoring often was conducted by the facilities 20 or more years ago, before activities under the Clean Water Act had improved aquatic

of the data on which EPA bases its estimates are outdated, and were collected during a period when some fish stocks were severely depleted. Furthermore, even current data are misleading with regard to total baseline I&E losses, because many fish stocks have been depleted, for instance by years of continual I&E losses. If initial stocks were at natural levels unaffected by past and present I&E, estimated baseline losses would be higher.

In order to quantify the effects of I&E losses on aquatic ecosystems, an analysis must take into account the full range of trophic interactions. Boreman (2000) emphasizes that all fish in an ecosystem, including those considered "surplus," have ecological significance, noting that "use of 'surplus' production is essentially an allocation issue among competitors for that resource." Thus, 'surplus' can be used "for supporting fisheries, for allowing the population to hedge against bad times, for providing extra sustenance for natural predators, or for supporting other uses of the resource."[22]

Link (1999) describes several trophic phenomena that should be taken into account in analyzing the likely effects of anthropogenic damage to fish populations.

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conditions.) In those locations where water quality was relatively degraded at the time of monitoring relative to current conditions, the numbers and diversity of fish are likely to have been depressed during the monitoring period, resulting in low I&E. In most of the nation's waters, current water quality and fishery levels have improved, so that current I&E losses are likely to be greater than available estimates for depressed populations."

[22] John Boreman, "Surplus production, compensation, and impact assessments of power plants," *Environmental Science and Policy* 3 (2000) S445-S449.

One of these is the phenomenon of cycles, in which species A feeds on species B at one life stage, while B feeds on A at another life stage. These cycles can lead to "stock bottlenecks" and can create a negative feedback loop as populations change. Likewise, cannibalism, in which fish consume younger members of the same species, can also interact with these cycles to create negative feedback loops. Link constructs a simplified model of the food web in the northwest Atlantic system in which humans are just one of 75 distinct nodes (some of which represent tens or hundreds of individual species, as Pisces explains in their NODA comments). Link emphasizes the "stochastic nature of this ecosystem" and the "consequent uncertainty in the predictions...." emerging from a system with complex dynamics.[23] Strictly speaking, if we are to correctly carry out the goal of quantifying the benefits of saving an aquatic ecosystem, all the elements of Link's model should be examined and traced through to a service that can be quantified and valued. Examining all these elements may well be an impossibly or impractically large task; once again, this problem highlights the difficulty of using a flawed methodology to develop policy.

The NODA relies on other questionable methodologies as well. The grounds for discounting future environmental benefits are debatable; underwater ecosystems are not financial assets that can be consumed or saved, depending on an investor's

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[23] Link, J.S., 1999, (Re)Constructing Food Webs and Managing Fisheries, in *Ecosystem Approaches for Fisheries Management*, Alaska Sea Grant College Program, AK-SG-99-01, at p.10.

rate of time preference.[24] The calculation of producer surplus, an important part of the estimated use value of fish killed by I&E, is based on a "rule of thumb" derived from just a few published studies – and is now estimated to be significantly smaller than in the EBA.[25] While these points do not have a large impact on the overall benefits estimate in the NODA, they are worth noting for future analyses.

4. Responses to Stavins Comments

In comments submitted in this docket, dated April 21, 2003, Dr. Stavins (who is now commenting on behalf of PG&E Energy Systems) responds in detail to our earlier comments on EPA's original cost-benefit analysis. Stavins repeatedly asserts, on the basis of his personal judgment, that we have confused positive and normative analysis or otherwise misunderstood basic principles of economics. Many, though not all, of the issues he raises remain relevant to the NODA. A point-by-point response is inappropriate here; suffice it to say that we continue to disagree on numerous aspects of the substance of the analysis, some of them discussed above.

Perhaps our most important disagreement concerns the magnitude of the environmental damages at stake. See, for instance, Stavins' statement that it was appropriate for him to estimate little or no nonuse value because only "*incremental* changes in the populations of various aquatic species" are involved in this case (April 21, 2003 letter, p.10, emphasis in

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[24] Frank Ackerman and Lisa Heinzerling, "Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection," *University of Pennsylvania Law Review* 150 (May 2002): 1553.

[25] NODA, p.13548, 13556.

original). Since EPA is valuing individuals, not populations, all the changes being analyzed are in a sense "incremental," though perhaps fairly big increments in some cases. Stavins' wording on this subject suggests a prior judgment that the increments at stake are, in fact, all so small that their nonuse value can be ignored.

We also want to respond briefly to Stavins' unfounded claims about the economics profession, and the extent of dissent within it. In effect, Stavins asserts that all reputable economists agree with him, and rejects our statements about the extent and influence of dissenting voices within the profession. To cite only the most important example, we mentioned that Amartya Sen, a recent Nobel laureate in economics (and the source of many provocative, innovative new approaches), rejected the idea of *individual* willingness to pay as a measure of the value of major environmental problems, because a rational individual's willingness to pay depends on what others are doing. Stavins suggests that we misinterpreted Sen, who, he says, was merely making a minor technical point about the free rider problem in the provision of public goods. Here is what Sen actually said on the subject:

> The philosophy behind contingent valuation [CV] seems to lie in the idea that an environmental good can be seen in essentially the same way as a normal private commodity that we purchase and consume. The valuation that is thus expressed is that of achieving single-handedly — this is crucial — this environmental benefit. Consider, for example, a case in which it is inquired how much I would

> pay to save all the living creatures that perished as a result of the *Exxon Valdez* disaster, and I say $20. As interpreted in CV, it is now presumed that if $20 paid by me would wipe out altogether all these losses, then I am ready to make that payment. It is hard to imagine that this question and answer can be taken seriously by any practical person (with some idea of what the *Exxon Valdez* disaster produced), since the state of affairs I am asked to imagine could not possibly be true.[26]

5. *Conclusion: The Need For Alternative Approaches*

Comparison of costs and benefits is not a necessary part of the decision about regulation of cooling water intake systems. The language of the Clean Water Act does not require cost-benefit analysis; rather, like many other environmental statutes, it sets forth technology and performance-based standards for protection of our natural environment. Retrospective analysis has shown that technology-based regulation is not always the economic disaster that regulatory critics sometimes suggest. For example, a massive, peer-reviewed study found that the first twenty years of the Clean Air Act had monetized benefits of more than $20 trillion, or more than 40 times its costs.[27]

It is fortunate that good decisions can be made without cost-benefit analysis, because it is so often

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[26] Amartya Sen, "The Discipline of Cost-Benefit Analysis," *Journal of Legal Studies* 29 (2) part 2, June 2000, 931-952, quote from 948.

[27] US EPA, *The Benefits and Costs of the Clean Air Act, 1970 to 1990* (October 1997).

necessary. The problems we have cited in the analysis of the benefits of regulating cooling water intake systems are similar to problems that arise in many cost-benefit studies. Many costs are readily monetized, while many of the benefits of protecting life, health, nature, and future generations are, literally, priceless — not infinite in value, but rather, incapable of meaningful monetization.[28] A broader, multi-dimensional approach to decision-making is required to reflect society's true preferences in such cases; technical economic analysis alone cannot reliably produce the right answers to questions of regulation and environmental protection.

Here we restrict our attention to a narrower question of alternative methods: when a comparison of costs and benefits is desired, what methods should be used? In our previous comments, we recommended that EPA abandon the impossible effort to calculate monetary values for all relevant benefits and costs of regulatory options. Instead, we recommended that the Agency simply calculate the cost per household of implementing regulations to protect aquatic ecosystems. These cost calculations could then allow a comparison of aggregate (largely monetized) costs and aggregate (largely non-monetized) benefits. The aggregate comparison of dissimilar categories of value is more sensible than the attempt at disaggregation and monetization of every conceivable benefit. The aggregate comparison recognizes the broad political and social, as opposed to narrow, technical and economic, nature of decisions about protection of natural resources.

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[28] Ackerman and Heinzerling, "Pricing the Priceless."

The "break-even" methodology that EPA proposes in the NODA is a promising start in this direction, but does not go far enough. Recognizing that it is far easier to estimate complete costs than complete benefits, the break-even calculation identifies the cost per household of regulations. However, this cost is presented in the NODA as a hurdle that has to be cleared by the data-intensive calculation of benefit values. We recommend that EPA go further, presenting costs per household of different regulatory options as key inputs into public decision-making. These costs could be accompanied by quantitative and qualitative descriptions, in natural units (e.g., numbers of various species of fish killed, not hypothesized monetary values of those fish), of the benefits of regulation — a vastly simpler task than the NODA agenda of monetization, or even last year's cost-benefit calculations. Under our method, there would undoubtedly still be controversy about the details of the cost calculations, and of the description of benefits - but these would be far simpler, more transparent and manageable disputes than the ones surrounding cost-benefit analysis.

The ultimate problem is that the conventional methodology of cost-benefit analysis, no matter how carefully performed, is still a conceptually flawed and inadequate method. As Robert Stavins eloquently expressed it in his Tuolumne analysis,

> When particular categories of benefits and/or costs are systematically excluded from an economic assessment, benefit-cost analysis loses its value as an aid to societal decision-making ... The B/C [benefit-cost] criterion is neither a necessary nor a sufficient condition

> for project investment ... What is crucial to keep in mind is that the benefit-cost criterion should not be used as an absolute decision rule ... Public-policy decisions regarding the use of the nation's scarce natural resources are ultimately political decisions, and should remain so.[29]

In the words of Amartya Sen,

> When all the requirements of ubiquitous market-centered evaluation have been incorporated into the procedures of cost-benefit analysis, it is not so much a discipline as a daydream. If, however, the results are tested only in terms of internal consistency, rather than by their plausibility beyond the limits of the narrowly chosen system, the glaring defects remain hidden and escape exposure.[30]

In conclusion, we regret that the limited scope of the NODA prevents us from commenting fully in advance of the final rule. The lack of information in the NODA creates a serious lack of transparency in EPA's decision-making process; we have no way to examine or evaluate the calculations that will, presumably, form the basis for EPA's final ruling. We recommend first, recognition that comparison of costs and benefits is not the only way to make good decisions, nor is it the method of decision-making set forth in the Clean Water Act. Second, when comparisons of costs and benefits are desired, we recommend that an alternative method of comparison b adopted, building on the foundation of

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[29] "Tuolumne River," 16, 31, 32, 101.

[30] Sen, "Discipline of Cost-Benefit Analysis," 952.

EPA's break-even calculation and comparing monetary costs to environmental benefits. In our view, this will highlight the vast ecological benefits available from strict regulation of cooling water intake systems, at a very modest nationwide average cost — a bargain we believe the American people should, and would, accept.

Sincerely,

Frank Ackerman
Rachel Massey

Comment ID 316bEFR.006.003

Subject Matter Code	10.07.02
RFC: Appropriateness of "significantly greater"	

Author Name Paul E. Reynolds

Organization Hoosier Energy Rural Elect. Co-op

"Significantly Greater"

The proposal provides for a site-specific determination of the "best technology available" if the costs of compliance at a site would be "significantly greater" than either the benefits of meeting the performance standards or the cost of what the agency considered. EPA must provide a clear definition of what is meant by "significantly greater." To maximize net benefits to society, economic theory would dictate that this should be interpreted to mean any cost benefit ratio greater that 1:1. This reflects the most cost-effective, performance-based outcome.

EPA Response

Under § 125.94(a)(5), a Phase II existing facility may seek a site-specific determination of best technology available if the Director determines, based on the facility's demonstration, that its compliance costs would be significantly greater than the costs

determined by the Administrator in establishing the final rule performance standards, or if its costs of compliance are significantly greater than the benefits of complying with the performance standards at the facility. As discussed in the proposed rule at 67 FR 17145 - 17146 (April 9, 2002), EPA has adopted the significantly greater cost-cost standard, rather the wholly disproportionate standard used in the Phase I rule, based on the fact that new facilities, regulated under Phase I, have greater flexibility than existing facilities, regulated under Phase II, in selecting the location of their intakes and technologies for minimizing adverse environmental impact so as to avoid potentially high costs, and it is therefore appropriate to push such facilities through use of a more stringent economic standard. In contrast, Phase II existing facilities encounter more substantial retrofit challenges (e.g., retrofitting an existing facility requires special consideration of various factors, including but not limited to the adequacy of space to accommodate a technology, approval and special conditions to locate such technology, potential redesign of intake, piping and cooling system components, often unique construction concerns, and secondary effects) and associated costs, and thus warrant somewhat broader flexibility. In addition, in contrast to the Phase I rule, the Phase II rule affects a significant portion of existing electric generating capacity. Thus, EPA believes it is appropriate to set a lower cost threshold in this rule to avoid economically impracticable impacts on energy prices, production costs, and energy production that might otherwise occur.

EPA has not expressly defined the term "significantly greater" in this rule. The Agency believes that a general standard, to be applied by the Director on case-by-case basis, is more appropriate for application in this rule since such a standard preserves reasonable discretion for the Director to compare assessments of costs and/or benefits, and make determinations that ensure that the costs of the rule are economically practicable or that there is a reasonable relationship between the costs of cooling water intake technology and the environmental benefits associated with its use. Numerous factors are considered in assessing costs and benefits, and use of a general standard allows an appropriate consideration of the totality of these factors under the rule. EPA notes that the "wholly disproportionate" standard applied historically, and as used in the Phase I rule, are not explicitly defined. The former has proven workable and, although it is too early to assess, the latter appears equally useful.

Also see response to 316bEFR.018.009 and 045.012.

Comment ID 316bEFR.010.027

Subject Matter Code	17.03.02
RFC: EPA rationale to not require closed-cycle	

Author Name Carl Michael Smith

Organization Dept of Energy

Wet Cooling Towers Should Not Be Required Except on a Case-by-Case Basis - Although EPA's proposed rule does not directly require any facilities to convert their cooling systems to wet cooling towers, some of the alternative options presented do require wet towers or their flow-based equivalents at some subset of facilities. DOE does not believe that the Phase II rule should require any particular class of facilities to convert to wet towers. We acknowledge that some existing, once-through cooled plants are causing AEI and will need to make some changes to their current operations. These changes could involve a combination of new intake technologies, or voluntary operational changes, and restoration measures. Some companies may elect to install wet cooling towers in order to minimize AEI. We believe that these cases will be infrequent, however.

In most cases, the costs to retrofit wet cooling towers will far exceed the costs to employ other remedies. We

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are pleased that EPA states on page 17155 that it did not select wet cooling towers as the best technology available for existing facilities because of the high costs of the retrofits and the potential for energy shortfalls related to concurrent retrofits at multiple plants. Even though we agree with EPA's decision, we feel that for several reasons the EPA projections of the costs and energy impacts of retrofit to wet towers have been underestimated. EPA presents their estimate of the cooling system conversion capital costs to be $53 per kW (moderate) to $62 per kW (high)—(Appendix C, Phase II Technical Development Document (TDD), page C-5). In comparison NETL has developed retrofit cost estimates through a draft study by its contractor, Parsons Infrastructure and Technology Group. That draft report (forthcoming), entitled "An Investigation of Site-Specific Factors for Retrofitting Recirculating Cooling Towers at Existing Power Plants," estimates wet cooling tower retrofit costs at four sites. The site-specific nature of wet cooling system retrofits at existing facilities is further underscored by the wide range of the cost estimates for the four sites in that draft study which are $66 per kW to $128 per kW. These estimates are on a similar basis as the EPA estimates.

Neither the EPA nor the NETL cost estimates take into account certain site specific factors such as plume abatement. DOE feels that the Agency should have made some assumptions in their cost estimates for a range of site-specific factors affecting the costs of retrofits at existing facilities. These factors include, but are not limited to, the necessity for plume abatement and/or drift control for facilities located in

urban areas or in close proximity to highways or airports, and the location of existing underground utilities that may have to be re-routed to accommodate the recirculating system's piping lay-out. For one of the sites in the NETL draft study, the capital cost of the cooling tower alone would double should the local permitting authority require the use of plume abatement. This was not included in the costs presented in the study. However if 1 out of 4 sites studied may have needed plume abatement, we believe EPA should have assumed that a certain number of facilities in their national cost estimate included site-specific retrofit costs such as plume abatement (see Comment 26).

EPA Response

No response is required for this comment as DOE is a Federal partner in the rulemaking.

Comment ID 316bEFR.010.057

Subject Matter Code	9.0
	Costs

Author Name Carl Michael Smith

Organization Dept of Energy

Compliance Cost Estimate - Section B1, Page B1-17. EPA identifies uncertainties and limitations to their compliance cost estimate. However, EPA does not identify uncertainty in their cost estimating procedure. For instance, what is the level of uncertainty in the capital cost estimate? This is the largest cost element provided in Table B 1-7, yet there is no mention of the level of accuracy for such an estimate. The reader is unclear whether this is based on conceptual, preliminary, or detailed engineering studies for all potentially affected facilities. The level of accuracy expected from EPA's cost estimation methodology should be discussed. Moreover, EPA's cost analysis for wet cooling tower retrofits neglects to make any allowance for site-specific requirements which may be mandated by State and local ordinances for plume cooling tower installation.

Through a web search on plume abated cooling towers, DOE was able to identify the following URL's describing either new facilities that will employ wet

cooling tower technology, or existing facilities that are retrofitting with wet cooling towers. DOE offers the following websites for EPA's consideration:

AES Granite Ridge, Londonderry, NH: http://www.aesc.com/londonderry/aesl_qna.html

NIST nuclear plant: http:///www.ncnr.nist.gov/AnnualReport/FY2000/operations.pdf and http://www. frm2.tu-muenchen.de/igorr/igorr-n113/ig-nl13-11.html

FPL Sacramento Power LLC: http://www.energy.ca.gov/sitingcases/riolinda/documents/applicants_files/2001-08-22_PROP_REVISION.PDF

Blythe Energy LLC: http:/www.energy.ca.gov/sitingcases/blythe/documents/2001-03-06_APPLICANTCOMMENT.PDF

Orion Power: http://www.orion.ene.com/files/executive_ summary/S11.pdf

Agnews Plant (Calpine) – San Jose, CA: http://www.santateresacitizen.org/plume.html

Calgary Energy Centre (Calpine): http://calgary energy. calpine.com/docs/Jan01_newsletter.pdf

Empire State Newsprint, Albany, NY: http://www.besicorp.com/empire/info.html

Metcalf Energy Center (Calpine), Santa Clara County, CA: http://www.metcalfenergycenter.com/execsummary. asp

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New York Power Authority, Astoria Plant, Queens, NY, new 500 MW CC: http://www.nypa.gov/ccf/NYPA%20Article%20X/text/Section%202.0%20Public%20Involvement%20(final).pdf

Badger Generating Co. LLC, Kenosha County, WI , new 1050 MW CC: http://www.psc.state.wi.us/cases/badger/exec_sum.htm

Customer list – Plume Abatement Cooling Towers – Emcotek: http://www.emcotek.com/references.htm

Duke Energy Morrow Bay Power Plant, conversion of 1058 MW gas-fired steam plant from once-through saline water cooling to cooling towers (saline water): http://www.morro-bay.ca.us/rwqcbsup.pdf

FPL Energy Elverta Power Project, Rio Linda, CA: http://obri.net/stop/fplcpac.html

Athens Generating Company, Athens, Greene County, NY, 1080 MW CC: http://www.stoptheplant.org/parks_and_recreation_brief.htm

From this list, it appears as though plume abatement features are commonly employed in new and retrofit wet cooling towers thereby further supporting DOE's position.

As can be seen by visiting the URL's identified on the list, plume abatement is not required by EPA rules, but by local permitting regulations. These regulations generally require that "visual impacts" of any proposed new installation be minimized. This usually means eliminating any visible vapor plume from a cooling

tower. If there is an airport anywhere in the vicinity, the FAA will also have to evaluate any potential visibility or icing impacts from a cooling tower vapor plume.

After reviewing this information, it seems obvious that by neglecting plume abatement entirely in their cost analysis, EPA is considerably underestimating the cost of compliance with the proposed Phase II regulations for options 1 and 4, given that plume abatement approximately doubles the cost of the cooling tower (by EPA's own cost estimate).

Additional costs should also be included for materials that would appropriately handle brackish or saline water. As EPA has indicated in a fax sent to NETL (D. Nagle to E. Parsons, January 18, 2002), these additional costs should be valued at 25 percent of tower costs. DOE agrees that this is a reasonable factor for corrosion resistant materials and drift elimination technology.

EPA Response

No Response Necessary to DOE comment.

Comment ID 316bEFR.010.101

Subject Matter Code	9.0
Costs	

Author Name Carl Michael Smith

Organization Dept of Energy

Energy Penalty Analysis of Possible Cooling Water Intake Structure Requirements on Existing Coal-Fired Power Plants

US Department of Energy

Working Draft -- May 23, 2002

1.0 Executive Summary

Section 316(b) of the Clean Water Act requires that cooling water intake structures must reflect the best technology available for minimizing adverse environmental impact. Many existing power plants in the United States utilize once-through cooling systems to condense steam. Once-through systems withdraw large volumes (often hundreds of millions of gallons per day) of water from surface water bodies. As the water is withdrawn, fish and other aquatic organisms can be trapped against the screens or other parts of the intake structure (impingement) or if small enough, can pass

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through the intake structure and be transported through the cooling system to the condenser (entrainment). Both of these processes can injure or kill the organisms. EPA adopted 316(b) regulations for new facilities (Phase I) on December 18, 2001. Under the final rule, most new facilities could be expected to install recirculating cooling systems, primarily wet cooling towers. The EPA Administrator signed proposed 316(b) regulations for existing facilities (Phase II) on February 28, 2002. The lead option in this proposal would allow most existing facilities to achieve compliance without requiring them to convert once-through cooling systems to recirculating systems. However, one of the alternate options being proposed would require recirculating cooling in selected plants.

EPA is considering various options to determine best technology available. Among the options under consideration are wet-cooling towers and dry-cooling towers. Both types of towers are considered to be part of recirculating cooling systems, in which the cooling water is continuously recycled from the condenser, where it absorbs heat by cooling and condensing steam, to the tower, where it rejects heat to the atmosphere before returning to the condenser. Some water is lost to evaporation (wet tower only) and other water is removed from the recirculating system as a blow down stream to control the building up of suspended and dissolved solids. Makeup water is withdrawn, usually from surface water bodies, to replace the lost water. The volume of makeup water is many times smaller than the volume needed to operate a once-through system.

Although neither the final new facility rule nor the proposed existing facility rule require dry cooling towers as the national best technology available, the environmental community and several States have supported the use of dry-cooling technology as the appropriate technology for addressing adverse environmental impacts. It is possible that the requirements included in the new facility rule and the ongoing push for dry cooling systems by some stakeholders may have a role in shaping the rule for existing facilities. The temperature of the cooling water entering the condenser affects the performance of the turbine—the cooler the temperature, the better the performance. This is because the cooling water temperature affects the level of vacuum at the discharge of the steam turbine. As cooling water temperatures decrease, a higher vacuum can be produced and additional energy can be extracted. On an annual average, oncethrough cooling water has a lower temperature than recirculated water from a cooling tower. By switching a once-through cooling system to a cooling tower, less energy can be generated by the power plant from the same amount of fuel. This reduction in energy output is known as the energy penalty. If a switch away from once-through cooling is broadly implemented through a final 316(b) rule or other regulatory initiatives, the energy penalty could result in adverse effects on energy supplies.

Therefore, in accordance with the recommendations of the Report of the National Energy Policy Development Group (better known as the May 2001 National Energy Policy), the U.S. Department of Energy (DOE), through its Office of Fossil Energy, National Energy

[Footer omitted in printing.]

Technology Laboratory (NETL), and Argonne National Laboratory (ANL), has studied the energy penalty resulting from converting plants with once-through cooling to wet towers or indirect-dry towers. Five locations – Delaware River Basin (Philadelphia), Michigan/Great Lakes (Detroit), Ohio River Valley (Indianapolis), South (Atlanta), and Southwest (Yuma) – were modeled using an ASPEN simulator model. The model evaluated the performance and energy penalty for hypothetical 400-MW coal-fired plants that were retrofitted from using once-through cooling systems to wet- and dry-recirculating systems. The modeling was initially done to simulate the hottest time of the year using temperature input values that are exceeded only 1 percent of the time between June through September at each modeled location. These are the same temperature inputs commonly used by cooling tower designers to ensure that towers perform properly under most climatic conditions. The high temperature inputs correspond to the time of year when the highest power demands are observed and the needs for generating capacity are most critical due to the very high cost of buying replacement power on the spot market. Later, modeling was completed to estimate the monthly energy penalties, which were arithmetically averaged to generate an estimate of annual average energy penalty.

The results of the one-percent-high temperature modeling show that conversion to a wet tower could cause energy penalties ranging from 2.4 percent to 4.0 percent. This means that the plant will produce 2.4 percent to 4.0 percent less electricity with a wet tower than it did with a oncethrough system while burning

the same amount of coal. That lost electricity could be made up at this plant or at some other existing or new plant by burning additional fuel. These peak-summer penalties are somewhat higher than those estimated by EPA in the technical documentation published with its April 9, 2002 proposal for existing facilities. DOE believes that EPA did not include all the relevant costs and made some inappropriate assumptions; these are described at the end of Chapter 4. When more appropriate costs and assumptions are considered, EPA estimates compare favorably with those in this report.

Conversion to an indirect-dry tower, where possible, could cause energy penalties ranging from about 8.9 percent to 12.14 percent using 20 degrees F for the approach (the difference between the inlet air dry-bulb temperature and the desired cold water temperature), and 12.7 percent to almost 16 percent using an approach of 40 degrees F. The industry norm for indirect dry towers – a 40-degree approach—was evaluated initially, but the resulting pressures for the steam turbines were found to result in unacceptable operating conditions during the one-percent highest temperature times of the year. The mostly likely way that a company could operate a retrofitted indirect-dry tower at a 40-degree approach would be to reduce the power output from the plant (load shedding) during the hottest times of the year – just when the power demand is the greatest.

This power output reduction imparts an immediate energy penalty. On completion of the analysis it was determined that even if load shedding was attempted

on all the 40-degree approach cases it would still be technically infeasible to operate the turbines safely during the summer months. To provide more information on dry tower energy penalties, a more conservative approach of 20 degrees was subsequently modeled.

The results of the annual energy penalty modeling show that conversion to a wet tower could cause energy penalties ranging from 0.8 percent to 1.5 percent. Conversion to an indirect-dry tower could cause energy penalties ranging from about 4.2 percent to 5.2 percent using 20 degrees F for the approach, and 7.9 percent to almost 8.8 percent using an approach of 40 degrees F.

A review of the "Environmental Directory of US Powerplants" (EEI 1996) indicated that in 1996, there were 258,906 MW of electric generating capacity in the United States that consisted of steam electric power plants employing once-through cooling. The one percent highest temperature analysis modeled plants in just five locations and under very warm temperature conditions, but the modeled facilities are believed to be representative of the climatic conditions found throughout those portions of the country where once-through cooling is prevalent. It is quite possible that much of the Nation could experience very high temperatures at the same time (e.g., week of August 6, 2001), leading to results even more extreme than those calculated here. Tables ES-1 and ES-2 demonstrate the effects on electric generating capacity during the one-percent highest temperature conditions if 10, 25, 50, or 100 percent of the existing once-through cooled

power plants in the United States were required to convert to either wet or indirect-dry cooling towers. The example of a requirement for 100 percent of the plants to retrofit to either wet or dry towers is hypothetical since it would be technically infeasible to do either. The energy, time, and expense required to make up for these losses is significant and would not necessarily require building new plants. But for example in the "average" case, 19 additional 400-MW plants might have to be built to replace the generating capacity lost by replacing oncethrough cooling with wet cooling towers in 100 percent of existing steam plants. If some of those affected plants were required to retrofit an indirect-dry tower, the energy penalty impacts would be over three times higher. For example, the "average" case might require 66 new 400-MW plants to be built to replace the generating capacity lost by replacing once-through cooling with indirect dry cooling towers with a 20-degree air-side approach in 100 percent of existing steam plants. This example of new plants needed if 100 percent of existing plants were required to retrofit to dry towers is far too low since after thoroughly completing this analysis it has been determined that it would be impossible for most existing plants to be retrofitted to dry towers at many locations and therefore there would be a need for closures and far more new power plants than provided in the simple example above.

These new power plants may be needed to replace the energy lost as a result of the conversion from once-through to recirculating cooling, and do not reflect the need to build additional new generating capacity to meet the nation's growing demands for electricity. The

U.S. Department of Energy's Annual Energy Outlook states that anticipated growth in electricity sales between 2000 and 2020 is about 1.8 percent per year (EIA 2001a). Alternatively, some of the existing plants that might have to retrofit to either wet or indirect-dry cooling systems may be able to just burn more fuel to replace the electricity lost due to the cooling system conversion. Either way, additional fuel will be burned and other adverse environmental impacts will be created such as increased emissions, land use, and noise pollution.

To more closely evaluate the impact of increased air emissions from burning additional fuel, several additional analyses were performed. Estimates of incremental air emissions were made using the average annual energy penalty results at the Delaware River Basin site and the South site. The results show that when once-through cooled plants are converted to wet cooling towers, the incremental air emissions are not large on a percentage basis (generally less than one percent), but the absolute increases in pounds or tons of key air pollutants (SO2, NOx, PM, mercury, and CO2) are large nonetheless. If once-through cooled plants are converted to indirect-dry towers, however, the incremental air emissions can be significant. For dry towers with a 20-degree approach, the percentage increase in air emissions can exceed 4 percent depending on how the power company makes up the lost energy. For dry towers with a 40-degree approach, the percentage increase in air emissions can approach 8 percent and the number of additional pounds or tons is quite large.

Incremental air emissions are of greatest concern in nonattainment areas. Nonattainment areas are identified for "criteria pollutants" established under the 1970 Amendments to the Clean Air Act that do not meet standards set by EPA. The term "criteria pollutants" derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised. Although a national impact analysis is not performed in the present study, a general conclusion is that incremental air emissions are counterproductive to achieving standards set by EPA for air quality. There are a number of nonattainment locations throughout the United States where incremental air emissions could occur from an energy penalty associated with a requirement to add a cooling tower to existing power plants.

One important finding of this report is that neither indirect-dry nor direct-dry towers are viable as a retrofit technology at most U.S. locations under the one-percent-highest temperature conditions. As previously noted, many of the model runs evaluating conversion to indirect-dry towers resulted in calculated turbine pressures that exceeded the upper limit for safe turbine operation. This was true of all of the model runs made using the 40-degree approach assumption and for one quarter of the runs made at 20 degrees. The point should be made that the practice of load shedding, a method of reducing the steam load through the turbine, thereby reducing the condenser heat duty by a proportional amount, would not effectively lower the turbine backpressure enough for

safe operation under the runs modeled with a 40-degree approach assumption. Even for those 20-degree approach cases in which the turbine pressures were below the upper safe limit, an indirect-dry tower would occupy huge amounts of space, which may not be available in an existing plant originally built with once through cooling. The results of sizing calculations to determine the required footprint area for a representative case of retrofitting to indirect dry towers at a 20-degree approach are discussed in section 10.2. Direct-dry towers are not practical either. In an existing plant, there simply is no room for the large-diameter ductwork required to conduct -atmospheric steam from the turbine exhaust hood to a direct-dry cooling tower.

Dry towers have been used as part of newly constructed cooling systems. If the entire power generating system (boiler, turbine, condenser, and cooling) is designed with dry cooling in mind, dry cooling does have applications. For retrofitted dry towers, the issues of large footprint and high energy penalty are important.

Table ES-1 - Wet Cooling Tower Energy Penalties and Impact at One Percent Highest Temperature Conditions

[see hard copy for table]

Table ES-2 - Indirect-Dry Cooling Tower Energy Penalties and Impact at One Percent Highest Temperature Conditions

[see hard copy for table]

[Footer omitted in printing.]

2.0 Glossary

[see hard copy]

3.0 Introduction

3.1 Legal Background for Cooling Water Intake Structure Requirements

Section 316(b) of the Clean Water Act, enacted by Congress in 1972, addresses withdrawal of cooling water from surface water bodies, as follows:

Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

In 1976, the U.S. Environmental Protection Agency (EPA) promulgated final §316(b) regulations (April 26, 1976; 41 FR 17387). However, those regulations were successfully challenged by a group of 58 utilities [Appalachian Power Co. v. Train, 10 ERC 1965 (4th Cir. 1977)]. In 1979, EPA formally withdrew its §316(b) regulations (June 1979; 44 FR 32956). As a consequence of the vacuum created by the absence of Federal regulations, many States adopted their own cooling water intake regulations to implement the §316(b) requirements. The broad statutory language facilitated widely differing interpretations by the States. Some adopted comprehensive programs, others imposed less rigorous requirements, and still others never developed formal regulations.

In the mid-1990s, a coalition of environmental groups, headed by the Hudson Riverkeeper, filed suit against EPA over failure to repromulgate §316(b) regulations [Cronin, et al. v. Reilly, 93 Civ. 0314 (AGS)]. On October 10, 1995, the U.S. District Court, Southern District of New York, entered a Consent Decree between the parties, directing EPA to regulate cooling water intake structures within 7 years. Under the Consent Decree, EPA agreed to propose regulations by June 1999 and promulgate a final rule by 2001. The Consent Decree was modified on November 21, 2000 to: a) finalize new facility regulations by November 9, 2001; b) propose existing source large utility and non-utility power producer regulations by February 28, 2002 and issue final regulations by August 28, 2003; and c) propose regulations by June 15, 2003 and issue final regulations by December 15, 2004 for other existing facilities not covered in b) above.

3.2 Purpose of This Report

EPA adopted 316(b) regulations for new facilities on December 18, 2001 (66 FR 65256). Under the final rule, most new facilities could be expected to install recirculating cooling systems, primarily wet cooling towers. The EPA Adminstrator signed proposed 316(b) regulations for existing facilities on February 28, 2002. The lead option in this proposal would allow most existing facilities to achieve compliance without needing to convert once-through cooling systems to recirculating systems. However, one of the alternative options proposed requires recirculating cooling in selected plants.

Until this rule is finalized, retrofitting to recirculating cooling remains a regulatory option.

Although neither the final new facility rule nor the proposed existing facility rule require dry cooling towers as the national best technology available, the environmental community and several States have supported the use of dry-cooling technology as the appropriate technology for addressing adverse environmental impacts. It is possible that the requirements included in the new facility rule and the ongoing push for dry cooling systems by some stakeholders may have a role in shaping the rule for existing facilities. Recognizing that over 50 percent of the existing coal-fired power plants employ once-through cooling systems, a decision to require many or all of these plants to install dry- or wet-cooling tower systems could have impacts on electricity costs and availability as well as secondary environmental impacts.

The purpose of this report is to quantify the loss of net electric output from an existing coal-fired power plant that would result from the replacement of its once-through cooling system to either a wet- or a dry-cooling tower. The reduction in net electric output is known as the energy penalty and is discussed below. Modeling was done for five locations to simulate the hottest time of the year using temperature values that are exceeded only 1 percent of the time between June through September at each modeled location. This corresponds to the time of year when the highest power demands are observed. To give an idea of the energy penalty at times other than the hottest period of the year,

additional modeling was conducted on a monthly basis. This technique allowed for the calculation of an annual average energy penalty value at each site.

In order to compensate for the electricity lost as a result of the energy penalty, utilities would need to produce more electricity through burning additional fuel, thereby generating additional air emissions. A second purpose of this report is to quantify the additional amount of air emissions that would result at existing coal-fired plants using wet or dry cooling systems. Estimates of incremental air emissions were made at the Delaware River Basin and the South sites.

4.0 Overview of Cooling Systems at Steam Electric Power Plants

4.1 Cooling Water Use

Water is used in many industrial applications to cool machinery or to condense steam. The largest industrial user of cooling water is the steam electric power industry. Data from a recent U.S. Geological Survey (USGS) report indicate that steam electric power generation uses approximately 190 billion gallons of water per day (USGS 1998). In 1999, more than 60 percent of the utility power generating capacity in the United States (382,270 MW) utilized the steam-electric process (EIA 2000). At nuclear and fossil-fuel power plants, electricity is produced by heating purified water to create high-pressure steam. The steam is expanded in turbines, which drive the generators that produce electricity. After leaving the turbines, the steam passes through a condenser that has multiple

tubes and a large surface area. A large volume of cool water circulates through the tubes, absorbing heat from the steam. As the steam cools and condenses, the temperature of the cooling water rises.

4.2 Types of Cooling Systems at Steam Electric Power Plants

Most power plants use either once-through cooling or recirculating cooling. Once-through cooling systems withdraw large volumes of water — typically in the range of tens of millions to billions of gallons per day from a river, lake, estuary, or ocean. The water is pumped through the condenser and finally returned to the same or a nearby water body. Recirculating cooling systems receive their cooling water from and return it to a cooling tower and basin, cooling pond, or cooling lake. Because evaporation and planned cooling tower blowdown (periodic discharges of portions of the recirculating water to remove build up of solids and other undesirable constituents) removes cooling water from the evaporative system, regular additions of "makeup" cooling water are needed. Makeup volumes are much lower than daily once-through volumes, and may range from hundreds of thousands to millions of gallons per day. The USGS estimates that about 2 percent of the water withdrawn for steam electric power generation was consumed as a result of once-through cooling, cooling towers, or pond cooling (USGS 1998).

This report considers two types of recirculating cooling systems – wet towers and indirect-dry towers. These are defined in Section 2 and described in Section 5.3.

4.3 How Cooling Water Affects Steam Power Plant Performance

High-pressure steam is generated in a boiler whose heat source is a high temperature atmospheric pressure furnace fired by some type of fossil fuel or a nuclear reactor. The high-pressure steam is expanded through a multistage turbine that turns a generator to produce electricity. Spent exhaust steam exiting the turbine is condensed and recycled to the boiler for steam production. During the condensation process, a large quantity of low-grade heat is absorbed by the condenser coolant, which is typically water.

The steam side of the condenser operates under vacuum conditions (i.e., a pressure below normal atmospheric pressure). The magnitude of the condenser vacuum depends chiefly upon the condenser design and the incoming temperature of the condenser coolant. Lower coolant temperatures will produce a larger vacuum in the condenser that, to a certain extent, has a favorable effect on performance. Likewise, higher condenser coolant temperatures are associated with a smaller vacuum, resulting in reduced energy output. These relationships are based on the laws of thermodynamics and hold true regardless of the type of cooling system used (once-through or recirculating).

4.4 The Energy Penalty

Steam condensers are designed to produce a vacuum at the outlet end of the turbine, thereby increasing the efficiency of the system. The temperature of the

cooling water exiting the condenser affects the performance of the turbine — the cooler the temperature, the better the performance. As cooling water temperatures decrease, a higher level of vacuum can be produced and additional energy can be extracted. On an annual average, once-through cooling water has a lower temperature than recirculated water from a cooling tower. Because most of the heat rejection in a wet cooling tower is due to evaporation, the temperature of the recirculated cooling water is limited by the ambient air wet- bulb temperature. It can never be lower than the wet-bulb temperature and generally is about 5 to 10 F higher. As a result of switching from a once-through cooling system to a cooling tower, less energy can be generated by the power plant from the same amount of fuel.

In a related manner, the performance of a dry cooling system is limited by the ambient air dry-bulb temperature because all of the heat rejection in a dry cooling system is attributable to sensible heating of the surrounding air. Since dry-bulb temperatures are higher than corresponding wet-bulb temperatures, the performance of dry cooling systems will be less than wet systems (either once-through or recirculating). In fact, a recent analysis of cooling system options for combined-cycle power plants found that at nearly all locations and under nearly all climatic conditions in the United States, the performance of a properly designed and operated recirculating cooling system would be superior to a comparable direct-dry cooling system (Burns and Micheletti 2000).2001). Therefore, switching a once-through cooling system to a dry cooling system would mean that the decline in power

generation for a given amount of fuel would be even greater than for a once-through to a recirculating wet cooling system retrofit.

Veil et al. (1992) summarized literature values for the energy penalty associated with retrofitting once-through cooled plants with wet-cooling towers. The majority of the data points for the energy penalty for fossil-fueled plants were clustered in a band between 1.5 percent to 2.5 percent. Results for nuclear power plants show greater variability, ranging between 1 percent and 5.8 percent. The data points were not as clearly clustered in a narrow range as were the data points for the fossil plants. Veil et al. (1992) selected a range of 2 percent to 3 percent for the decrease in net electrical power that could be experienced if existing nuclear power plants retrofit from once-through to wet cooling.

In a more recent study, Burns and Micheletti (2000) estimate the maximum energy penalty values for a new generic 750-MW combined-cycle power plant using either a wet recirculating cooling system or a direct dry cooling system at sites in five different parts of the country. In this study, the energy penalty is defined as the loss of electricity generating capacity incurred when a cooling system is unable to perform at design efficiency. Then for both types of cooling systems, the maximum energy penalty occurs during the hottest times of the year when ambient wet-bulb and dry-bulb temperatures are greatest. This period normally is represented by 1 percent of the time during the four warmest months, which also happen to coincide with the times of national peak electricity demand. For

recirculated wet cooling, the estimated maximum energy penalty was less than 1 percent for any of the five sites. For direct dry cooling, the estimated maximum penalty ranged from 11.6 percent to 18.1 percent, depending on site climatic conditions. Although the estimates prepared by Burns and Micheletti indicate a dramatic difference in the maximum energy penalties expected from using wet and dry cooling systems, the results are not directly comparable to this study for two reasons. First, the Burns and Micheletti estimates were based exclusively on new cooling systems for new plants and did not consider any of the retrofit complexities associated with an existing once-through cooling system at an existing plant. Second, the Burns and Micheletti estimates were based on a direct-dry cooling system, while an indirect dry cooling system would be a more suitable retrofit option for an existing once-through cooling system (see subsequent discussion in Section 5.3).

For its 316(b) regulation development, EPA researched and derived energy penalty estimates based on empirical data and proven theoretical concepts for a variety of conditions (EPA 2002). To estimate nationally representative energy penalties, EPA sought data to estimate representative regions. These four regions include Northeast (Boston, MA), Southeast (Jacksonville, FL), Midwest (Chicago, IL) and Northwest (Seattle, WA). The Agency calculated the turbine component of the energy penalty by examining the empirical effect on net plant heat rates resulting from changing turbine exhaust pressures for fossil-fueled, combined-cycle, and nuclear plants. The

Agency related the turbine exhaust pressure to ambient conditions for the selected locations. Because the source water temperature for once-through cooling systems and the ambient wet bulb and dry bulb temperatures for cooling towers varies with location and time of year the Agency used empirical coastal water temperatures at the four selected locations.

For calculation of monthly average wet and dry bulb temperatures, EPA calculated time-weighted averages during the daytime period between 8 AM and 4 PM. Since the energy penalty will vary over time as ambient climatic and source water temperatures vary, the calculation of the total annual energy penalty for a chosen location integrated the results of individual calculations performed on a periodic, monthly basis. EPA used design temperatures to calculate peak-summer penalties for the selected locations based on the temperature that ambient conditions equaled or exceeded one percent of the time.

EPA derived the turbine exhaust pressure values for alternative cooling system scenarios in conjunction with the empirical temperature values. EPA used these turbine exhaust pressure values to estimate the associated change in turbine efficiency. EPA then calculated either the peak-summer (design) or the monthly energy penalty. Annual values were calculated by averaging the 12 monthly values. The annual average energy penalty values for fossil-fueled plants at the four regional sites ranged from 1.5 to 1.8 percent and the peak-summer energy penalties ranged from 1.4 to 2.0 percent.

[Footer omitted in printing.]

It should be noted that EPA's annual average energy penalties were based on assuming that plants operate at just 67 percent of maximum load. The DOE does not agree with this assumption for base load plants and has brought this to EPA's attention. Subsequently, EPA estimated a 1.1% annual energy penalty based on assuming that plants operated at 100 percent of the maximum load.

The annual average penalties presented in Chapter 8 of this report are similar to those calculated by EPA, but the EPA estimates of peak summer energy penalties are considerably lower than those presented in Chapter 7 of this report. The reasons for this discrepancy are:

- EPA does not include all the pumping costs associated with a wet tower retrofit. The additional pumping costs could add approximately 0.2 to 0.7 percent to EPA's energy penalty estimates.

- EPA uses a range assumption at or near 20 degrees, which is higher than that used in most of the DOE model runs. Those runs were based on actual temperature data provided by EPA for each of the model locations (see descriptions in Chapter 7). If a 15-degree range were used, the energy penalty would increase by about 0.5 percent.

- EPA's analysis assumes that the condenser duty is the same when converting from once-through cooling to wet cooling

towers. DOE estimates that this could result in a maximum additional penalty of 0.5 percent.

Adding the contributions from these three items yield a possible increase in the EPA peak energy penalty of 1.0 to 1.5 percent and a revised EPA peak energy penalty of 2.7 to 3.2 percent for conversion to wet towers. These revisions to the EPA analysis to adjust to similar basis with this study shows approximate agreement to the DOE results.

[comment continued in 316bEFR.0 10. 102]

EPA Response

No response is required for this comment as DOE is a Federal partner in the rulemaking.

Comment ID 316bEFR.011.004

Subject Matter Code	18.01
RFC: Definition of "adverse environmental impact"	

Author Name Christine Martin

Organization PA Dept of Environmental Protection

[A] definition of "adverse environmental impact" (AEI) focused on overall environmental protection is necessary to provide the flexibility needed to achieve the best environmental outcome in individual cases. PA DEP generally supports using biological assessment approaches to determining the ecological and/or community or populational impacts that may be related to adverse environmental impacts which are associated with the impingement and/or entrainment by a cooling water intake structure. This follows the approach PA DEP uses in assessing environmental impacts of thermal discharges under Section 316(a) of the CWA. The Section 316(a) provisions are intended to "assure the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife in and on that body of water;" and would be workable and consistent with federal and state goals of ensuring adequate protection to aquatic resources. PA DEP, however, fully recognizes that determining the potential AEI that may be attributed to the cooling

water intake structure is difficult, especially in complex situations where multiple stressors may compound the observed impacts. Therefore, PA DEP would request that we remain party to EPA's on-going considerations of the definition and related methods that will identify what is considered as AEI under this rule.

EPA Response

In today's final rule, EPA has elected not to define adverse environmental impact. Consistent with the Phase I New Facility Rule, EPA believes that it is reasonable to interpret the minimization of adverse environmental impact as minimizing the loss of aquatic organisms due to impingement and entrainment. The Agency has long maintained that adverse environmental impact from cooling water intake structures must be minimized to the fullest extent practicable. The objective of section 316(b) includes population effects but is not limited to those effects. EPA has considered the consequences associated with the loss of large numbers of aquatic organisms, including impacts on the stocks of various species, loss of compensatory reserve due to the deaths of these organisms and the overall health of ecosystems. Given all of these considerations, EPA determined that there are multiple types of undesirable and unacceptable adverse environmental impacts which result from impingement and entrainment and which must be minimized. EPA has rejected all proposed alternative definitions of adverse environmental impact because they are too broad and dependent on proven damage on the community and population levels before controls on cooling water intake structures could be put in place as

the best technology available. EPA does not view adverse environmental impact as limited to demonstrated community or population level effects. Damage on the community or population level is extremely difficult to quantify and attribute to a particular cooling water intake structure given the vast number of environmental factors and anthropogenic factors which work concurrently on fisheries at that organizational level. It is difficult to isolate the effect of a single factor. Many cooling water intake structures have been in operation for decades. During these years, fish populations have been affected by other factors such as overfishing, habitat alteration and water quality changes. Because of these simultaneously-occurring factors, the determination of a change in a population that is directly attributable to the operation of a cooling water intake structure may prove to be very difficult.

Comment ID 316bEFR.029.032

Subject Matter Code	9.0
	Costs

Author Name Elise N. Zoli

Organization Godwin Proctor Counselors at Law obo Entergy Corporation

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EPA also fails to include the significant energy penalty due to the shutdown of units during installation. The impact is particularly significant and in some cases compromising of the local electric system's reliability, if facilities shut down permanently because conversion is not economically feasible. EPA also fails to account for turbine back-pressure, which EPA concedes could significantly affect net facility capacity, see Phase II TDD Ch. 5.3, by assuming that turbine backpressure for a retrofitted facility would be the same as for a new facility with cooling towers. Impacts to system reliability and energy pricing is expected to be severe, as discussed below. Certainly, EPA's conclusion that impacts are nominal is patently erroneous, as applied to Entergy stations. See National Economic Research Associates ("NERA"), Electricity System Impacts of Nuclear Shutdown Alternatives, dated March 2002 (Appendix 6). Department of Energy (DOE), and others, concur. See Phase II TDD at 5-31 to 5-34.

By way of example, in the important peak summer period, Vermont Yankee Nuclear Power Facility sacrifices 9 megawatts to operate the cooling towers and an additional 20 megawatts due to increased condenser back pressure as a result of higher condensate temperatures. These megawatts represent 5.3% of Vermont Yankee Nuclear Station's available power. Further, this power generation represents the major source (i.e., 78%) of electric power in Vermont, with the result that impacts of any reduction would be severe for Vermont's electricity consumers.

EPA Response

EPA has considered the energy penalty issue raised by the commenter and it was one of the factors influencing EPA's decision to not base the requirements of the final rule on this technology.

Comment ID 316bEFR.075.057

Subject Matter Code	9.04
Cooling system costs (e.g., dry, wet, recirculating)	

Author Name Maureen F. Vaskis & Mark F. Strickland

Organization PSEG Services Corporation, Ofc of Environmental Counsel

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USEPA Substantially Underestimated the Costs of Retrofitting to Closed Cycle Cooling.

USEPA cannot justify any of the closed cycle cooling alternatives based on the data and information contained in the Docket. Even though, as shown below, the costs USEPA estimated are substantially lower than estimates based upon site-specific engineering estimates for existing facilities or extrapolations based on such analyses. USEPA, in the Preamble, rightly states that it did not select a nation-wide, closed-cycle requirement (i.e., the first closed-cycle option) "because of the generally high costs of such conversions... and serious concerns about the short term energy implications of a massive concurrent conversion and the potential for supply disruptions that it would entail." <FN 59> This was the right

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conclusion and PSEG believes it is equally applicable to the second and third closed-cycle options as well.

PSEG endorses USEPA's conclusion that the costs of retrofitting are too high, especially since USEPA substantially underestimated the costs for retrofitting existing facilities to operate with closed cycle cooling. USEPA provides the costs it relied upon to reach this conclusion in the EBA. <FN 60> USEPA estimated the total annualized cost for retrofitting all 426 power plants to be approximately 2.32 billion dollars or on average, approximately 5.45 million dollars per facility (annualized total cost). In connection with Section 316 (b) Demonstrations <FN 61> filed with the New Jersey Department of Environmental Protection ("NJDEP") between 1998 and 2001, PSEG commissioned preliminary engineering analyses and cost estimates for retrofitting three of its power plants located on estuaries or tidal rivers to operate with closed cycle cooling. These analyses were conducted for power plants that would have been within the scope of any of USEPA's three closed-cycle cooling options, and given the mix of fuel types and sizes of these plants, the cost estimates for these plants are likely to bound estimates that would be representative for a considerable range of facilities that would be affected by these options. As discussed below, Shaw Stone & Webster's report for UWAG <FN 62> corroborates PSEG's capital cost estimates for these facilities and echoes the conclusion that USEPA substantially underestimated the costs of retrofitting existing facilities for closed cycle cooling systems.

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a. Mercer Generating Station

PSEG's Mercer Generating Station ("Mercer") consists of two coal-fired units withdrawing up to 345.6 MGD of once-through cooling water from the tidal river portion of the Delaware Estuary near Trenton, NJ. <FN 63> The present value capital cost to retrofit Mercer with wet mechanical draft cooling towers was estimated to be 55.74 million dollars. <FN 64> The total capital cost estimate presented in the Mercer C/B Analysis includes the following cost components: capital, labor and materials associated with construction and installation (Table 8-1). The PSEG total cost estimate of 55.74 million is very close to the 58.53 million estimated for Mercer Units 1 and 2 combined by Shaw Stone and Webster, Inc. <FN 65>

b. Hudson Generating Station

PSEG's Hudson Generating Station ("Hudson") consists of Units 1 and 2 that are natural gas and coal or natural gas fired units respectively. Unit 1 withdraws 388.8 mgd and Unit 2 withdraws 504.0 mgd of once-through cooling water from the estuarine reach of the Hackensack River. The total present value cost to retrofit Hudson with wet mechanical draft cooling towers was estimated to be 104.57 million dollars. <FN 66> The total capital cost estimate presented in the Hudson C/B Analysis includes the following cost components: capital, labor and materials associated with construction and installation (Table 8-1). The PSEG total cost estimate of 104.57 million dollars is the close to the 117.48 million dollars estimated for Hudson Units 1 and 2 combined in Shaw Stone and Webster Report.

[Footer omitted in printing.]

c. Salem Generating Station

PSEG's Salem Generating Station ("Salem"), a base-load nuclear facility, consists of two units <FN 67> with a combined intake flow of up to 3,024 MGD of once-through cooling water from the Delaware Estuary. <FN 68> The total present value capital cost estimate to retrofit Salem with wet mechanical draft cooling towers was 576.0 million dollars. <FN 69> The total capital cost estimate presented in Appendix F to Salem's 1999 Application is comprised of the following cost components: capital, labor and materials associated with construction and installation, (Appendix F IX Table 1). The PSEG total cost estimate of 576.0 million is close to the 593.32 million estimated for Salem Units 1 and 2 combined in Shaw Stone & Webster Report.

The total present value capital cost estimates for Mercer, Hudson and Salem were adjusted to total annualized capital costs so direct comparisons could be made to USEPA's facility cost estimate. The total annualized costs for retrofitting Mercer, Hudson, and Salem are estimated at $6.31, 8.69, and 51.07 million, respectively. <FN 70> The PSEG estimates for Mercer, Hudson, and Salem are substantially higher than USEPA's average total annualized cost estimate for an individual facility (i.e., 5.45 million in dollars). The PSEG estimates and the Shaw Stone & Webster estimates are based on preliminary engineering analyses conducted for existing facilities. USEPA, on the other hand, developed its estimates by extrapolating from its estimate of the costs associated with installing cooling towers at a new facility. It

clearly stands to reason that the PSEG and UWAG estimates of substantially greater costs are more reliable. Also, the differences between the PSEG and Shaw Stone & Webster's estimate as compared to USEPA estimates indicate that consideration of site-specific factors are extremely important in providing realistic cost estimates for retrofitting existing facilities with mechanical draft cooling towers.

In short, USEPA has substantially underestimated the costs that would be borne by society if a closed-cycle cooling alternative were adopted. Even using these substantial under-estimates, the Agency rightfully determined that the costs would outweigh any benefits that might result. Even the inclusion of provisions, whereby permittees could have (1) implemented restoration measures in lieu of retrofitting upon a demonstration of comparable performance or (2) petitioned for less stringent requirements if certain tests could be met <FN 71> would be insufficient to overcome the fundamental flaw caused by the substantial underestimation of costs.

Footnotes

59 67 Fed. Reg. 17122, 17155, col. 1 and 2.

60 EBA, p. B7-9.

61 Public Service Electric and Gas Company (PSEG). Hudson Generating Station Supplemental 316(b) Report, Chapter 8, "Costs and Benefits of Alternatives for Modifying Cooling Water Intakes", November 1998 ("Hudson C/B Analyis"); Public Service Electric and Gas Company (PSEG). Renewal Application Salem

Generating Station NJPDES Permit No. NJ0005622. Appendix F: Clean Water Act Section 316(b) Demonstration, Section IX, "Costs and Benefits of Fish Protection Alternatives", Volume 14 of 36, March 4, 1999; PSEG Fossil LLC (PSEG) ("Appendix F to Salem's 1999 Application"); Mercer Generating Station 316(b) Demonstration. Chapter 8, "Costs and Benefits", November 2001 ("Mercer C/B Analysis").

62 Shaw Stone & Webster, Inc., Engineering Cost Estimate for Retrofitting Closed-Cycle Cooling Systems at Existing Facilities, Appendix 15 to UWAG Phase II comments Prepared for the Utility Water Act Group ("Shaw Stone & Webster Report") (2002).

63 Mercer C/B Analysis, supra.

64 All Mercer cost estimates are present values as of January 1, 2002, in millions of 2000 dollars.

65 UWAG's Phase II Comments, Appendix 15, Cost of Retrofitting Cooling Towners at Existing U.S. Power Plants ("UWAG – Appendix 15").

66 All Hudson cost estimates are present values as of January 1, 2000, in millions of 1997 dollars.

67 Appendix F to Salem's 1999 Application.

68 PSEG had also commissioned Stone & Webster Engineering Corporation ("SWEC") to perform a preliminary engineering analysis and cost estimate for retrofitting Salem in 1990, which were updated in 1993 and again in 1999. In 1993, at the request of the NJDEP, PSEG hired a second firm, Sargent & Lundy

("S&L") to conduct a validation and verification of SWEC's work product. S&L confirmed that SWEC's design approach and cost estimates were reasonable and appropriate. S&L concluded that SWEC's engineering analysis and their cost estimates associated with the closed-cycle cooling retrofit were reasonable and consistent with sound engineering practice (Appendix F to Salem's 1999 Application, Section VIII). In 1999, SWEC reconfirmed the conclusions reached in 1990 and 1993 that retrofitting Salem with a closed-cycle cooling system would require an unprecedented and complex construction effort (Appendix F to Salem's 1999 Application, Attachment 7).

69 All Salem cost estimates are present values as of January 1, 2001, in millions of 1998 dollars.

70 The Mercer estimate assumed a 7% discount rate with construction starting in 2002 and costs extending through 2015; the Hudson estimate assumed a 5.78% discount rate with construction starting in 2000 and costs extending through 2022; and the Salem estimate assumed a 6.19% discount rate with construction starting in 2001 and costs extending through 2021(All values are 2001 dollars).

71 See, 67 Fed. Reg. 17154 col. 1 and 2, Section VI.B.

EPA Response

See response to comment 316b.EFR.208.002.

Comment ID 316bEFR.306.116

Subject Matter Code	21.04
Determination of compliance	

Author Name Doug Dixon & Kent Zammit

Organization EPRI

Additional Comments

Site-specific variability in the physical sciences and biology, CWIS operation, and performance of fish protection technologies, as we have long noted in our comments and reports, indicates the importance of providing flexibility in the determination of the species and metrics to be used during both baseline characterization and technology performance assessment. The following additional points are noted for consideration relative to providing flexibility in determining technology performance or in setting standards of performance:

- Exclusion of fish that are moribund or dead on arrival, as discussed in the NODA, is notable and logical. CWIS will act as 'filters' and collect moribund and dead fish that occur in the water due to natural causes (e.g., cold shock, low dissolved oxygen) and these organisms should be excluded from performance assessments. Not only should they be excluded, the technology

should not be expected to perform at 'normal' standards because of clogging of screens, fish return troughs, etc. Essentially, expectation of technology performance to 'target' standards should not be expected during episodic fish kills. Standards for determining/identifying moribund and dead fish can be ascertained on a site-specific basis.

EPA Response

With regard to EPA's approach to the exclusion of moribund or dead organisms from determining compliance, it is generally EPA's position that naturally dead or moribund organisms should not be factored into the impingement or entrainment rates of a facility. However, EPA has left the final determination on methodology employed to the Director. EPA has included a provision in the Verification Monitoring Plan which allows a facility to exclude moribund or dead organisms. The facility may submit a proposal the Director as part of the Verification Monitoring Plan, that details how naturally moribund fish and shellfish that enter the cooling water intake structure would be identified and taken into account in determining compliance with the performance standards in § 125.94.

Comment ID – 316bEFR.317.013

Subject Matter Code	6.03
Impacts of CWIS on impaired waterbodies	

Author Name	Basil G. Constantelos
Organization	Midwest Generation EME, LLC

Waterbody-Specific Protection is Warranted

Equal protection is not required for every waterbody in Illinois, as evidenced by the fact that a significant portion of the waterways located in the Chicago area are designated as Secondary Contact and Indigenous Aquatic Life waters, due to their inability to meet the fishable / swimmable" standards required by the Clean Water Act. These waterways have been either created or significantly altered by human disturbances for more than one hundred years, and function largely as conveyances for treated effluents and barge transport, while still supporting a fair assemblage of aquatic organisms which are suited to this particular environment. The types of species expected to be entrained and/or impinged by power plants on these waterways are largely rough, low quality fish such as common carp, buffalo and gizzard shad, in addition to the invasive species noted above. These species are

not "valued" (within the meaning of EPA's economic analysis) and do not warrant the same kind of protection as more desirable or ecologically important species, such as game fish, threatened or endangered species or other species important to the support of the food chain and/or recreational industry in any particular waterway. State natural resources management agencies have long been allowed to give greater protection to those waterbodies which can support the greatest diversity of quality aquatic species. This is another important example of why flexibility is required to allow the States to direct their limited resources to the protection of the most ecologically important waterways. The proposed 316(b) rule, as presently written, will result in the broad application of uniform controls for waterbodies without the necessary consideration of whether a comparable environmental benefit is attainable.

EPA Response

In order for species to coexist in a given area and utilize the same resources, they must occupy a separate and distinct niche. EPA believes all species native to given waterbody warrant the same level of protection. Although the author may consider common carp, buffalo and gizzard shad to be "rough, low quality fish", their presence in the waterbody indicates they do occupy a distinct niche and contribute to the food chain in the ecosystem. That said, EPA believes today's final rule allows ample flexibility for the States to set their own priorities.

PETITIONER'S BRIEF

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Nos. 07-588, 07-589, 07-597 (Consolidated)

In the Supreme Court of the United States

ENTERGY CORP., *Petitioner*,
v.
ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,
v.
RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner*,
v.
RIVERKEEPER, INC., ET AL., *Respondents.*

On Writs Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF FOR PETITIONERS ENTERGY CORP., PSEG FOSSIL LLC, AND PSEG NUCLEAR LLC

ELISE E. ZOLI
Counsel of Record
KEVIN P. MARTIN
ROBERT H. FITZGERALD
ALADDINE D. JOROFF
KEVIN P. PECHULIS
GOODWIN PROCTER LLP
53 STATE STREET
BOSTON, MA 02109
(617) 570-1000
Counsel for Entergy Corp.

MAUREEN E. MAHONEY
Counsel of Record
PHILIP J. PERRY
J. SCOTT BALLENGER
CASSANDRA S. BERNSTEIN
DREW C. ENSIGN
LATHAM & WATKINS LLP
555 11TH STREET, NW
SUITE 1000
WASHINGTON, DC 20004
(202) 637-2200
Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

Additional Counsel Listed on Inside Cover

JULY 14, 2008

ABIGAIL HEMANI
GOODWIN PROCTER LLP
NEW YORK TIMES BUILDING
620 8TH AVENUE
NEW YORK, NY 10018
(212) 813-8800

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. PEARL STREET
JACKSON, MS 39201
(601) 969-2542
Counsel for Entergy Corp.

KARL S. LYTZ
LATHAM & WATKINS LLP
505 MONTGOMERY STREET
SUITE 2000
SAN FRANCISCO, CA 94111
(415) 391-0600

JOHN G. VALERI, JR.
PSEG SERVICES CORP.
OFFICE OF ENVIRONMENTAL
COUNSEL
80 PARK PLAZA, T5C
NEWARK, NJ 07102-4194
(973) 430-5506
Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

QUESTION PRESENTED

Whether §316(b) of the Clean Water Act, 33 U.S.C. §1326(b), authorizes the Environmental Protection Agency (EPA) to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

PARTIES TO THE PROCEEDING

In the United States Court of Appeals for the Second Circuit, the petitioners were Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay-People for Narragansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, Surfrider Foundation, State of Rhode Island, State of Connecticut, State of Delaware, Commonwealth of Massachusetts, State of New Jersey, State of New York, Appalachian Power Company, Illinois Energy Association, Utility Water Act Group, Entergy Corporation, and PSEG Fossil LLC and PSEG Nuclear LLC (collectively "PSEG"). The respondents were United States Environmental Protection Agency and Stephen L. Johnson, in his official capacity as Administrator of the United States Environmental Protection Agency. Appalachian Power Company and the Illinois Energy Association are not parties to this appeal.

Pursuant to Supreme Court Rules 24.1 and 29.6, there is no change to the corporate disclosure statement previously filed by Entergy or PSEG.

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OPINION BELOW

The opinion of the U.S. Court of Appeals for the Second Circuit (Pet.App.1a–94a[1]) is reported at 475 F.3d 83 (*"Riverkeeper II"*).

JURISDICTION

The Second Circuit entered judgment on January 25, 2007, and denied petitions for rehearing and rehearing *en banc* on July 5, 2007. After this Court extended the time for filing petitions for certiorari, petitioners timely filed petitions on November 2, 2007. This Court granted certiorari on April 14, 2008. This Court has jurisdiction pursuant to 28 U.S.C. §1254(1).

STATUTORY AND REGULATORY PROVISIONS INVOLVED

This case involves §316(b) of the Federal Water Pollution Control Act, commonly known as the Clean Water Act ("CWA" or "Act"), 33 U.S.C. §1326(b).[2] This provision and other relevant portions of the CWA are reproduced in the addendum to this brief and at Pet.App.97a–121a. The U.S. Environmental Protection Agency's ("EPA") rule at issue here (the "Phase II rule") is codified at 40 C.F.R. pt. 125, subpt. J, and reproduced at Pet.App.122a–593a.[3]

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1 Citations to "Pet.App." refer to the Appendix to the Petition for Certiorari filed by Entergy Corp. in No. 07-588. "J.A." refers to the Joint Appendix filed herewith.

2 We refer to CWA sections ("§316(b)") and, where appropriate, provide citations to the U.S. Code ("33 U.S.C. §1326(b)").

3 "National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake

STATEMENT OF THE CASE

Section 316(b) of the Clean Water Act states that "[a]ny standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. §1326(b). The issue here is whether, as respondents contend, EPA is forbidden from considering costs in relation to benefits when selecting the "best technology available for minimizing adverse environmental impact" ("BTA") for cooling water intake systems. In their view, with very few exceptions, EPA *must* require each of the Nation's existing base-load electric-generating facilities to retrofit with any technology capable of saving additional fish or other aquatic organisms from being trapped against components of the intake structure ("impinged") or drawn into the cooling water system itself ("entrained")—a requirement that will cost hundreds of millions or billions of dollars per facility, regardless of the cost or actual environmental benefit. Pet.App.170a–71a, 255a–56a (69 Fed. Reg. at 41,586, 41,605).

For 30 years, EPA implemented §316(b) on a facility-by-facility basis, rejecting the application of particular intake structure technology at a given facility if the costs would be "wholly disproportionate" to the environmental benefits. In this rulemaking, EPA set national performance standards for cooling water intake structures at Phase II existing facilities

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Structures at Phase II Existing Facilities," 69 Fed. Reg. 41,576 (July 9, 2004).

by determining ranges of reductions in impingement mortality and entrainment that could be achieved in a cost-effective manner, and identifying a number of technologies capable of achieving such results. EPA also quite reasonably included a provision in the rule authorizing site-specific determinations of BTA where, in relevant part, the costs of retrofitting a particular facility would be "significantly greater than" the environmental benefits. *See* Brief of Petitioner Utility Water Act Group ("UWAG Br."), at 6-11, 23-25, 42-57.

The Second Circuit invalidated EPA's balanced rule, adopting a radical interpretation of §316(b) under which EPA must set national standards without regard to cost, except that EPA may decline to require technologies that could not be borne by the industry *as a whole*. That individual base-load electric plants would be forced to shut down did not trouble the court. Likewise, at the site-specific level, EPA must require technologies that impose costs for *no* guaranteed additional benefits over a substantially less costly alternative technology. The Second Circuit reached this radical conclusion in part by reading this Court's precedents as effectively imposing a "clear statement" requirement for cost-benefit analysis, one forbidding agencies from weighing costs and benefits in implementing *any* statute unless Congress has expressly granted the agency permission to do so.

The Second Circuit's decision is wrong. This Court's precedents impose no clear statement rule for cost-benefit analysis. Such a rule is inconsistent with ordinary rules of deference to agencies and is wholly unwarranted. Even if such a rule did exist, §316(b), read both alone and within the broader structure of the Act, plainly permits EPA to weigh costs and benefits in

regulating cooling water intake structures. Other sections of the Act cross-referenced by §316(b) specifically authorize EPA to consider costs, as well as any other factors it deems appropriate. At a bare minimum, §316(b) is at least ambiguous on the question of cost-benefit analysis, and EPA's interpretation is reasonable and therefore entitled to deference. And EPA's authority to permit a site-specific determination of BTA is clearly consistent with both §316(b) and its general authority to provide variances from regulatory requirements. *See* UWAG Br. at 42-57.

Unless reversed, the Second Circuit's decision will undermine the ability of EPA and other agencies to use cost-benefit analysis to further rational decisionmaking. It will undermine agency efforts to set rigorous national standards secure in the knowledge that the agency can impose alternative requirements where the benefits clearly do not justify the costs. And, as the U.S. Department of Energy forewarned in this rulemaking, it will jeopardize the United States' core electric generating capacity through a regime of potentially perpetual retrofitting driven by changes in intake structure technology and the applicable five-year permit renewal cycle, with the massive expenditures and lengthy shutdowns such retrofits would entail. *See, e.g.*, J.A.311-13; J.A.320–24; J.A.345-51.

A. Background

1. Cooling Systems

To ensure safe, efficient operation, steam electric-generating facilities (such as those owned by petitioners Entergy and PSEG) require some means to absorb or dissipate the waste heat created by power

generation. Most such facilities draw in surface water to circulate through their systems as a coolant.

The amount of cooling water needed and the means by which that water is drawn into a facility are fundamental facets of plant design. Broadly speaking, there are three categories of cooling systems. Some facilities draw in water, pass it once through the plant, then release most of it back to surface waters ("once-through cooling"). Pet.App.554a (69 Fed. Reg. at 41,685). Other facilities draw water into cooling towers, ponds, or other structures, circulate it several times through the plant for cooling, and consume the vast majority by releasing it to the air as water vapor, with only a small discharge back to surface waters (wet "closed-cycle" cooling systems). Pet.App.551a (69 Fed. Reg. at 41,684); J.A.319. And yet others utilize so-called "dry cooling," which principally relies on air instead of water for cooling. Pet.App.8a n.3.

All cooling systems have environmental and energy advantages and disadvantages, and EPA carefully considered these differences in developing the rule. Pet.App.253a–54a (69 Fed. Reg. at 41,604). Once-through cooling systems optimize energy output and minimize air emissions, but they sometimes add heat to the receiving water. They also withdraw larger volumes of water, and thus increase the potential for impingement and entrainment. Pet.App.239a–40a (69 Fed. Reg. at 41,601). In comparison, both closed-cycle and dry cooling systems withdraw less water and add little or no heat to the receiving water, but they are less effective at cooling and therefore reduce the efficiency and electric output of the facilities using them. *Id.*; Pet.App.257a–58a (69 Fed. Reg. at 41,605); J.A.318-22.

For example, when a once-through system is converted to a closed-cycle system (which may not always be feasible and requires the facilities to be taken offline), the retrofitted facility is capable of generating less energy using the same amount of fuel due to the differences in water temperature. J.A.320. Because this permanent "energy penalty" can be up to 5% or more of a facility's output, requiring facilities to convert to closed-cycle cooling negatively affects energy supply and electric system reliability. J.A.320-25; J.A.333-34; Pet.App.257a–58a (69 Fed. Reg. at 41,605). It also requires greater consumption of fuels to make up for the energy penalty which, in turn, generally results in increased air emissions of carbon dioxide and other pollutants. Pet.App.258a (69 Fed. Reg. at 41,605); J.A.325-26.

In addition, closed-cycle and dry cooling systems may create other adverse environmental impacts, such as requiring more land use, causing fogging and icing, and increasing noise pollution. Pet.App.259a (69 Fed. Reg. at 41,606); J.A.316-17; J.A.325.

2. Section 316(b) of the Clean Water Act

Section 316(b) occupies a unique place within the CWA, for (unlike most other sections) it does not address the *discharge* of pollutants but rather the environmental impacts associated with the *withdrawal* of water by cooling water intake structures. Pet.App.151a (69 Fed. Reg. at 41,582). Such impacts include, but are not limited to, impingement and entrainment. Pet.App.169a (69 Fed. Reg. at 41,586) (impacts "depend[] on conditions at the individual site").

The Second Circuit has twice acknowledged that §316(b) was "something of an afterthought." *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 186 n.12 (2d Cir. 2004) ("*Riverkeeper I*"); *see also* Pet.App.4a–5a. This "afterthought" status is reflected in the legislative history. In the sole reference to §316(b), Representative Clausen, a Floor Manager for the Conference Report for the 1972 Act, explained:

> Section 316(b) requires the location, design, construction, and capacity of cooling water intake structures ... to reflect best technology available for minimizing adverse environmental impact. The reference here to "best technology available" is intended to be interpreted to mean *the best technology available commercially at an economically practicable cost.*

118 Cong. Rec. 33,762 (1972) (emphasis added).

3. Technology Requirements Under §§301 and 306

Section 316(b) explicitly links the determination of BTA for cooling water intake structures to the process for setting standards for the *discharge* of various pollutants under CWA §§301 and 306, 33 U.S.C. §§1311, 1316. Accordingly, the Second Circuit and the parties before this Court agree that those provisions inform the interpretation of §316(b)—though they disagree on the lessons to be drawn.

For new facilities, §306 requires EPA to establish "standards of performance" that "reflect[] the greatest degree of effluent reduction which the Administrator

determines to be achievable through application of the best available demonstrated control technology" ("BADT"). 33 U.S.C. §1316(a)(1), (b)(1)(B). This standard reflects Congress's understanding that it is more feasible and economical to install technologies when a facility is being constructed. *See Riverkeeper I*, 358 F.3d at 185; Pet.App.360a. Nonetheless, EPA is authorized to consider "the cost of achieving such effluent reduction," as well as any non-water quality impacts and energy requirements, when setting BADT standards. 33 U.S.C. §1316(b)(1)(B).

Section 301 requires all point sources, whether existing or new, to comply with a series of technology-based pollutant discharge limitations. 33 U.S.C. §1311(b)–(e). First enacted in 1972, but subsequently amended as explained below, §301 originally contemplated two phases of standards for all dischargers. The initial phase required facilities to implement the "best practicable control technology currently available" ("BPT"). In establishing a BPT standard, EPA *must* compare "the *total cost* of application of technology in relation to the *effluent reduction benefits* to be achieved from such application." 33 U.S.C. §1314(b)(1)(B) (emphasis added); *see Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045 (D.C. Cir. 1978) (referring to costs and benefits as "'comparison factors'"). In other words, EPA is *required* to perform cost-benefit analysis in selecting BPT.

By 1983, those initial BPT standards were to be followed by "best available technology economically achievable" ("BAT") standards. Pub. L. No. 92-500, 86 Stat. 844–46 (1972). Congress directed EPA, when setting BAT standards, to "take into account" factors

enumerated in §304(b)(2)(B), including "the cost of achieving such effluent reduction ... *and such other factors as the Administrator deems appropriate.*" 33 U.S.C. §1314(b)(2)(B) (emphasis added). Congress did not, however, specify how EPA must consider those factors. *Weyerhaeuser*, 590 F.2d at 1045. As the D.C. Circuit has explained, under BAT "[a]ll factors, including costs and benefits," are not mandatory "'comparison factors,'" as under BPT, but rather are discretionary "'*consideration* factors'" that give EPA flexibility in deciding how much weight to give each factor. *Id.* (emphasis added).

To provide additional flexibility to address unanticipated adverse economic and social consequences stemming from the BAT requirements, Congress included a safety valve in the 1972 Act. Section 301(c) authorizes a variance from BAT standards where the individual discharger can show that an alternate limit represents the maximum use of technology within its economic capability and will result in "reasonable further progress" toward the elimination of discharges. 33 U.S.C. §1311(c). This provision contemplates a kind of "economic capability/effluent reduction balancing." *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 77 n.16 (1980).

While §301 of the 1972 Act contemplated all discharges of pollutants being subject first to BPT and then to BAT standards under §301, Congress amended the Act in 1977 to create a three-tiered regulatory system, the goal of which was to regulate specific tiers of pollutants based on the actual threat they posed. At the top in terms of potential harm are toxic pollutants, which include "disease-causing agents ... [that] will ... cause death, disease, behavioral abnormalities, cancer

... or physical deformations," among other harms. 33 U.S.C. §1362 (definition). Toxic pollutants remain subject to the BAT standard, which still allows EPA to consider what weight to give costs and benefits. *See* 33 U.S.C. §1311(b)(2)(C)–(D); *id.* §1317 (toxic effluent standards).

Congress also established a category of "conventional pollutants," which need only comply with the "best conventional pollutant control technology" ("BCT") standard. 33 U.S.C. §1311(b)(2)(E). BCT, like the 1972 Act's BPT standard, *requires* EPA to evaluate "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. §1314(b)(4)(B). In other words, the 1977 amendments *mandated* cost-benefit analysis for conventional pollutants.

Finally, Congress created a tier of pollutants referred to as "non-conventional, non-toxic" pollutants, such as chlorine. In the 1977 amendments Congress retained the BAT standard for these pollutants, but it also provided, in §301(g) of the Act, a waiver provision allowing EPA to set less stringent limits so long as (among other requirements) the lesser standards would still ensure "protection and propagation of a balanced population of shellfish, fish, and wildlife." 33 U.S.C. §1311(g)(2)(C).

In sum, the CWA provides EPA considerable authority to weigh costs and benefits to ensure rational regulatory outcomes, either mandating or permitting cost-benefit analysis for each of the categories of pollutants established by the amendments to §301. For non-conventional pollutants, cost and benefits may be

considered under both EPA's BAT discretionary authority and the §301(g) variance. For conventional pollutants, cost-benefit analysis is now required. And, even for toxic pollutants, EPA may consider "the cost of achieving such effluent reduction" and "such other factors as [EPA] deems appropriate" in setting BAT standards, and may modify standards based on the economic capability/effluent reduction balancing authorized by §301(c).

4. EPA's Phase II Rulemaking

In 1976 EPA promulgated its first final rule under §316(b), but the Fourth Circuit remanded it one year later on procedural grounds. *See Appalachian Power Co. v. EPA*, 566 F.2d 451, 457 (4th Cir. 1977); Pet.App.159a–60a (69 Fed. Reg. at 41,583–84). For the next 30 years, EPA and state permitting authorities implemented §316(b) on a case-by-case basis, weighing costs and benefits in approving intake structures. Pet.App.355a (69 Fed. Reg. at 41,627). At EPA's direction, permitting authorities declined to require "use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Pub. Serv. Co. of N.H., (Seabrook Station, Units 1 and 2)*, 1977 WL 22370 (EPA), at *7, 1 E.A.D. 332 (June 10, 1977), J.A.76; *see also* UWAG Br. at 15-16, 37-41.

The current §316(b) rulemaking originated in a 1995 consent decree that required EPA to promulgate national §316(b) regulations. The rulemaking was conducted in three phases. In Phase I, EPA set forth standards for cooling water intake structures at new steam-electric generating facilities. The Phase II rule, at issue here, governs the Nation's approximately 550

large existing power-producing plants, each designed with the capacity to withdraw at least 50 million gallons of water per day and to use at least 25% of the water exclusively for cooling purposes. *See* Pet.App.124a, 203a (69 Fed. Reg. at 41,576, 41,593). These facilities comprise approximately 50% of the Nation's electric power supply. Office of Water, EPA, *Economic & Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule*, at A2-2 (2004) (50% of total projected for 2008), *available at* http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm; *id.* at A3-13.[4] And in Phase III, EPA promulgated regulations governing existing facilities not covered under Phase II (including smaller power plants) and new offshore oil and gas facilities.[5]

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[4] To implement the requirements of the Phase II rule for existing facilities, EPA chose to rely on the National Pollutant Discharge Elimination System ("NPDES") permit-renewal process set forth in §402, 33 U.S.C. §1342(a)(1). *See* Pet.App.150a–52a (69 Fed. Reg. at 41,582). The NPDES re-permitting process requires existing dischargers to apply for a renewed NPDES permit every five years. While §402 on its face is limited to discharge requirements, the Second Circuit deferred to EPA's determination that NPDES permits may be used to impose new intake structure requirements on existing facilities. Pet.App.15a.

[5] As explained below, the Second Circuit resolved challenges to the Phase I rule in 2004, explicitly affirming EPA's use of cost-benefit analysis in choosing BTA for new facilities. The Phase III rule authorizes permit writers to select BTA for existing facilities on a case-by-case basis using the same type of cost-benefit analysis rejected by the Second Circuit here. 71 Fed. Reg. 35,006, 35,014–15, 35,016–17 (June 16, 2006). Challenges to the Phase III rule are currently pending in the Fifth Circuit. *See* UWAG Br. at 16-17 n.15.

In developing the Phase II rule, EPA targeted assumed impingement mortality and entrainment, under the assumption that doing so would assist aquatic populations taxed by, among other things, over-fishing. *See* Pet.App.169a, 188a (69 Fed. Reg. at 41,586, 41,590).[6] Rejecting a nationwide mandate of closed-cycle cooling, the Agency concluded that the best technology available for minimizing adverse environmental impact varies among sites. Pet.App.255a (69 Fed. Reg. at 41,605). It therefore crafted the rule to require "technology that is technically available, economically practicable, and cost-effective while at the same time authorizing a range of technologies that achieve comparable reductions in adverse environmental impact." Pet.App.157a–58a (69 Fed. Reg. at 41,583).[7]

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[6] As EPA explained, the technical information on which it relied to reach its assumptions about entrainment and impingement was anecdotal and, in many cases, outdated and/or highly imprecise. Pet.App.181a–82a (69 Fed. Reg. at 41,588) (many studies "based on limited data ... collected ... 25 years ago" and containing "serious study design limitations"). EPA also acknowledged that it was guided by a precautionary principle, one that it indicated would be subject to further analysis in the site-specific application of the rule. Pet.App.183a–84a (69 Fed. Reg. at 41,589).

[7] The Second Circuit drew a distinction between "cost effectiveness" analysis, which it believed permits only a search for the cheapest way of achieving a given result, and "cost benefit" analysis, which permits a true weighing of marginal costs and benefits. *See infra*, at 18–20. EPA sometimes used the phrase "cost effectiveness" in the rule, but not in the narrow sense meant by the Second Circuit. *See* Pet.App.263a (69 Fed. Reg. at 41,606). EPA explained that it "consider[ed] the cost of technologies in relation to the reductions in impingement mortality and entrainment achieved," which clearly is a form of *cost-benefit*

EPA determined that the goal of "minimizing adverse environmental impact" was best achieved by national performance standards that require all Phase II facilities to reduce impingement mortality by 80-95% from an uncontrolled level ("calculation baseline") and, when appropriate, entrainment by 60-90%. *See* Pet.App.560a (40 C.F.R. §125.94(b)(1)–(2)) (requiring compliance with entrainment standards based on capacity utilization rate and, in relevant part, location on a particular waterbody type, such as an estuary or ocean). EPA explained that these performance standards "reflect best technology available [and] ... are not based on a single technology but, rather, are based on consideration of [the] range of technologies that EPA has determined to be commercially available for the industries affected as a whole." Pet.App.228a (69 Fed. Reg. at 41,599). The standards therefore reflect the Agency's judgment that, "given the wide range of various factors that affect the environmental impact posed by Phase II existing facilities, different technologies or different combinations of technologies can be used and optimized to achieve the performance standards." Pet.App.226a (69 Fed. Reg. at 41,598); *see also* Pet.App.228a (69 Fed. Reg. at 41,599) ("range of available technologies ... used to derive the performance standards").

In developing the national BTA requirements, EPA determined that existing facilities have far less flexibility than new facilities because their intake

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analysis under the Second Circuit's terminology. EPA Second Cir. Br. at 55; *see also id.* at 50 ("EPA's cost-effectiveness analysis compares the *incremental* costs of technology to its *incremental* effectiveness in minimizing ... impingement mortality and entrainment.").

structures have already been located, designed, and constructed. Pet.App.141a (69 Fed. Reg. at 41,580) (limitations include space, as well as location and development on a waterbody); Pet.App.255a (69 Fed. Reg. at 41,605) (retrofits "may be impossible or not economically practicable"). EPA therefore included two alternative compliance options—both allowing a facility to request a site-specific determination of best technology available for minimizing adverse environmental impact in certain circumstances. Pet.App.193a, 195a–96a (69 Fed. Reg. at 41,591). These provisions reflect EPA's longtime reading of §316(b) as "indicat[ing] that site-specific conditions can be highly relevant to the determination of BTA to minimize adverse environmental impact." Pet.App.351a–52a (69 Fed. Reg. at 41,626); *see* UWAG Br. at 15-16, 37-41 (history of case-by-case permitting).

At issue here is the site-specific determination based on a "cost-benefit test," which allows facilities to request establishment of site-specific standards where they can demonstrate that the costs of meeting the national standards would be substantially greater than the benefits. Pet.App.249a–51a (69 Fed. Reg. at 41,603–04); Pet.App.559a (40 C.F.R. §125.94(a)(5)(ii)). The technology selected by the permitting authority for a facility qualifying under this provision "must achieve an efficacy level that comes as close as practicable to the applicable performance standards without resulting in significantly greater costs." Pet.App.196a (69 Fed. Reg. at 41,591).

5. *Riverkeeper I*

Five months before EPA issued the Phase II rule, the Second Circuit resolved challenges to EPA's Phase

I rule in *Riverkeeper I*. In relevant part, environmental petitioners (respondents here) challenged EPA's selection of closed-cycle cooling over dry cooling as BTA for new facilities. EPA had selected closed-cycle cooling on the basis that, *inter alia*, "dry cooling costs more than ten times as much per year as closed-cycle wet cooling," but provided only incremental improvements in reducing impingement mortality and entrainment. *Riverkeeper I*, 358 F.3d at 194–95. Environmental petitioners challenged this weighing of costs and benefits, arguing that "because section 316(b) does not mention cost or other factors, the EPA cannot give them any weight ... and even if the EPA was permitted to consider those factors, it abused its discretion in weighing them." *Id.* at 195.

The Second Circuit squarely rejected this argument and upheld EPA's choice of BTA. First, the court determined that the cross-reference to §306 in §316(b) "is an invitation [for EPA] to look to section 306 for guidance" in selecting BTA for new facilities. *Id.* at 186. The court observed that even when setting new source performance standards under §306, EPA is authorized to "'take into consideration,'" among other factors, "'the cost of achieving such effluent reduction.'" *Id.* at 195 (quoting §306). The court thus concluded that "EPA was permitted to consider cost and energy efficiency in determining the 'best technology available.'" *Id.*

The Second Circuit also noted that "'[a]ppellate courts give EPA considerable discretion to weigh and balance the various factors'" applicable to §306, including cost. *See id.* at 195 (quoting *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002)). Addressing the Phase I rule, the court explained that

"*it is undeniably relevant that the difference*" in impingement and entrainment reduction offered by dry cooling "*represents a relatively small improvement over closed-cycle cooling at a very significant cost.*" *Riverkeeper I*, 358 F.3d at 194 & n.22 (emphasis added). Accordingly, the Second Circuit rejected the environmental petitioners' challenge and deferred to EPA's selection of closed-cycle cooling, concluding that the court (unlike EPA) was "not well equipped ... to meaningfully weigh" the incremental benefits of dry cooling against its incremental environmental and monetary costs. *Id.* at 196 (EPA better placed to compare entrainment reductions against "300 pounds of mercury, and $443 million").

B. The Decision Below

The Phase II rule was challenged by environmental and state respondents, as well as industry petitioners, with the challenges consolidated before the Second Circuit in *Riverkeeper II*. Of relevance here, environmental and state petitioners challenged EPA's designation of a suite of technologies—as opposed to closed-cycle cooling—as BTA, as well as the provision allowing site-specific BTA determinations based on a "cost-benefit test." Pet.App.20a. As in *Riverkeeper I*, they argued that §316(b) does not permit weighing of costs and benefits, and also argued that EPA exceeded its authority in rejecting closed-cycle cooling as BTA for all existing facilities. *Id.*; Pet.App.29a n.14.

The Second Circuit accepted those arguments in a confusing opinion that misunderstands the language of §316(b) and other cross-referenced provisions of the Act, fails to defer to EPA's interpretation, and ignores its own holding—reached just three years earlier in

Riverkeeper I—that EPA has "'considerable discretion to weigh and balance'" costs and benefits in regulating under §316(b). *Riverkeeper I*, 358 F.3d at 195 (citation omitted).

The Second Circuit presented three bases for its conclusion that cost-benefit analysis is prohibited under §316(b). First, the Second Circuit reasoned that "[t]he BTA standard of section 316(b) ... is linguistically similar to the BAT standard of section 301 and the standard that applies to new sources under section 306." Pet.App.23a. Accordingly, the court explained, "to the extent that cost-benefit analysis is precluded under those sections"—a reading rejected by other courts, as explained below—"it is similarly not permitted under section 316(b)." *Id.*

To reach this idiosyncratic reading of §§301 and 306, the Second Circuit focused on the differences between §301's BPT and BAT standards, which the court read as having "clearly signaled Congress's intent to move cost considerations ... from a cost-benefit analysis *to a cost-effectiveness one*." Pet.App.22a (emphasis added). "Cost-effectiveness," according to the Second Circuit, means that, within "a narrowly bounded range," EPA "may permissibly choose between two (or more) technologies that produce essentially the same benefits but have markedly different costs." Pet.App.28a, 22a. As applied to §316(b), the Second Circuit explained that "cost-effectiveness" means that, if EPA is "given a choice between a technology that costs $100 to save 99-101 fish and one that costs $150 to save 100-103 fish," it "could appropriately choose the cheaper technology." Pet.App.27a. If, however, industry could bear the cost of technology saving "at least 102 fish," then EPA could not choose the cheaper technology saving at most

only 101 fish, whatever the difference in cost. Pet.App.27a–28a.

Second, the court of appeals reasoned that the phrase "best technology available for minimizing adverse environmental impact" is inherently inconsistent with cost-benefit analysis, and "represents Congress's conclusion that the costs imposed on industry in adopting the best cooling water intake structure technology available (*i.e.*, the best-performing technology that can be reasonably borne by the industry) are worth the benefits in reducing adverse environmental impacts." Pet.App.57a–58a; *see also* Pet.App.23a–28a. The Second Circuit did not attempt to square that "plain meaning" interpretation with the fact that other "best technology" standards under the Act expressly permit *or even require* cost-benefit analysis.

Third, the Second Circuit relied on the fact that §316(b) does not on its face explicitly mention cost-benefit analysis, and essentially extracted from this Court's cases an unprecedented presumption that cost-benefit analysis is forbidden if not expressly authorized:

> [Our] conclusion is further supported by the fact that Congress in establishing BTA *did not expressly permit* the Agency to consider the relationship of a technology's cost to the level of reduction of adverse environmental impact it produces. "When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such on the face of the statute."

Pet.App.25a (emphasis added) (footnote omitted) (quoting *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 510 (1981) (hereafter "*American Textile*")).

Applying those principles, the Second Circuit expressed concern that EPA had weighed costs and benefits in rejecting closed-cycle cooling as BTA for all Phase II facilities. Pet.App.28a–33a. The court remanded this aspect of the rule because, in the court's estimation, it was unclear on the record whether EPA had incorrectly "construed the statute to permit cost-benefit analysis," had "misunderstood or misapplied cost-effectiveness analysis," or had "simply failed either to perform the required analysis or to explain adequately a decision that was within its authority to make." Pet.App.36a–37a. The court also remanded the Phase II performance standards derived from EPA's selection of BTA, acknowledging that "EPA may ... set performance standards as ranges," but expressing concern that the chosen ranges do not require Phase II facilities "to achieve as much reduction of adverse environmental impacts as technologically possible." Pet.App.38a, 43a.

In addition, the Second Circuit invalidated the rule's provision authorizing site-specific determinations of BTA based on a cost-benefit test. Pet.App.56a–60a. The court held that "[j]ust as the Agency cannot determine BTA on the basis of cost-benefit analysis, it cannot authorize site-specific determinations of BTA based on cost-benefit analysis." Pet.App.58a. It further reasoned that site-specific cost-benefit analysis would "impermissibly authorize[] the EPA to consider the degraded quality of waterways in selecting a site-specific BTA," which the court believed to be inconsistent with the general policy of the Act. *Id.*

Citing the extent of the rule's provisions affected by the Second Circuit's decision, EPA subsequently suspended the Phase II rule. 72 Fed. Reg. 37,107 (July 9, 2008) (formal notice following memorandum suspending rule).

SUMMARY OF ARGUMENT

The Second Circuit held that §316(b) of the Clean Water Act requires EPA to mandate the height of current technology for reducing impingement and entrainment of aquatic organisms by cooling water intake structures, without regard to costs, so long as that technology will save at least a few more fish and the costs will not cripple the entire industry. The Second Circuit's radical interpretation must be rejected, for several reasons.

First, the Second Circuit relied on a presumption, drawn from a misunderstanding of this Court's opinion in *American Textile*, that cost-benefit analysis may be considered only if expressly authorized by Congress. There is no such clear statement rule, and it makes no sense to start from a presumption that Congress would prefer agencies not to weigh costs and benefits when implementing statutes. If anything, the usual presumption should be the opposite. Congress does not ordinarily intend that its statutes be implemented in ways that do more harm than good. And EPA's consideration of costs and benefits under §316(b) reflects 30 years of agency practice.

Second, §316(b)'s language authorizes EPA to consider costs in relation to benefits, particularly when §316(b) is placed in its broader statutory context. The phrase "best technology available for minimizing adverse environmental impact" delegates enormous

discretion to EPA. The "best" technology "*for* minimizing" an effect is not necessarily the one that reduces that effect as much as possible (*i.e.*, the best *at* minimizing). As even the Second Circuit acknowledged, the word "available" necessarily requires some judgment about what is economically reasonable. And "minimize" does not necessarily mean "eliminate to the maximum extent feasible;" it frequently just means "reduce."

Section 316(b) also cross-references the standard-setting process under §§301 and 306 for the Act's various other "best technology" standards. The Second Circuit thought that the §316(b) standard should be interpreted consistently with the strictest BAT standard under §301, which governs the most toxic pollutants and which the court of appeals wrongly believed forbids cost-benefit analysis. In fact, the provisions implementing BAT expressly authorize EPA to "take into account ... the cost of achieving such effluent reduction" as well as "such other factors as the Administrator deems appropriate." 33 U.S.C. §1314(b)(2)(B). EPA is at least authorized, and in some cases required, to weigh costs against benefits when setting *every* technology standard under the Act. Moreover, it is far from clear that BAT is the appropriate analogy for a standard governing water intakes. *See* UWAG Br. at 11-15, 45-47.

The Second Circuit's interpretation also leads to results that Congress could not possibly have intended, and that come perilously close, at least, to absurdity. If facility-specific cost-benefit considerations must be ignored in determining the ideal "location, design, construction, and capacity" for an intake structure, EPA must shut its eyes to the fact that, for example, a

particular facility impinges mostly dead fish or nuisance fish that federal and state regulators *want* to eliminate. Likewise, EPA would have to ignore that losses caused by the facility are so small in relation to the size and health of the relevant fish population that the most cautious regulator would consider them trivial. These facts clearly are relevant to any decision about whether "adverse environmental impacts" exist and have been minimized, yet the Second Circuit's decision would require they be ignored.

Finally, the statute is at a minimum ambiguous on these issues. EPA's interpretation of the Act "is entitled to considerable deference; and to sustain it, [the Court] need not find that it is the only permissible construction ... but only that EPA's understanding of this very 'complex statute' is a sufficiently rational one to preclude a court from substituting its judgment for that of EPA." *Chem. Mfrs. Ass'n v. NRDC*, 470 U.S. 116, 125 (1985). EPA (and the states that implement the vast majority of permitting programs) have reasonably interpreted this statute for more than 30 years to permit cost-benefit analysis. That interpretation has been upheld by the courts and implemented in countless permitting decisions, and has never been questioned by Congress despite multiple amendments to the Act. *See* UWAG Br. at 15-16, 37-41.

ARGUMENT

I. THE SECOND CIRCUIT'S NEW CLEAR STATEMENT RULE FOR COST-BENEFIT ANALYSIS IS CONTRARY TO PRECEDENT AND MUST BE REJECTED

In proscribing EPA from weighing costs and

benefits to determine BTA at the national and site-specific level, the court of appeals relied on a presumption, drawn from its interpretation of this Court's pre-*Chevron* decision in *American Textile*, that cost-benefit analysis must be unambiguously authorized by Congress. The Second Circuit's clear statement rule is based on a misreading of *American Textile*, clearly outdated in light of *Chevron* and its progeny, and unsound as a matter of policy and reasonable inferences about congressional intent.

A. The Second Circuit's Clear Statement Rule For Cost-Benefit Analysis Is Inconsistent With This Court's Precedent

In *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 843–44 (1984), this Court made clear that when a statute "is silent or ambiguous with respect to the specific issue," a court "may not substitute its own construction of [the] statutory provision for a reasonable interpretation made by the administrator of an agency" responsible for its implementation. Instead, "[whenever] there is statutory ambiguity and the agency's interpretation is reasonable, its interpretation must receive deference." *Yellow Transp., Inc. v. Michigan*, 537 U.S. 36, 46 (2002). In this case, however, the Second Circuit concluded that cost-benefit analysis is prohibited unless explicitly authorized, based solely on this Court's statement in *American Textile* that "'[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute.'" Pet.App.25a (quoting *Am. Textile*, 452 U.S. at 510).

Neither the quoted language from *American*

Textile, nor the decision as a whole, can bear the weight placed on them by the Second Circuit. *American Textile* addressed an industry claim that the Occupational Safety and Health Act ("OSHA") was *required* to conduct a cost-benefit analysis when implementing worker safety standards that required the Secretary of Labor, "in promulgating standards dealing with toxic materials or harmful physical agents ... [to] set the standard which most adequately assures, to the extent feasible ... that *no employee will suffer material impairment* of health or functional capacity." 29 U.S.C. §655(b)(5) (emphasis added). Of course that statute—which protects human health and would not allow a single worker to be exposed to a preventable material impairment—specifies a regulatory goal far more stringent and specific than §316(b)'s direction that EPA "minimiz[e] adverse environmental impact." Regardless, in the passage the Second Circuit focused on, this Court simply observed that a court should look to the face of a statute to determine whether Congress "*intended*" to require the agency to engage in cost-benefit analysis—in other words, whether cost-benefit analysis is *required*, not whether it is *permitted*. 452 U.S. at 510 (emphasis added). That is a straightforward, uncontroversial statement of interpretive principle fully consistent with *Chevron*.

The rest of this Court's opinion in *American Textile* confirms that this Court only addressed the question whether cost-benefit analysis was *required* by that statute. For instance, this Court stated that "[t]he principal question presented in these cases is whether [OSHA] *requires* the Secretary ... to determine that the costs of the standard bear a reasonable relationship to its benefits," and echoed that it was "faced with the

issue whether the Act *requires* OSHA to balance costs and benefits." *Am. Textile*, 452 U.S. at 506, 509 n.29 (emphasis added). Likewise, in explaining its holding, this Court twice stated that it was "reject[ing] the argument that Congress *required* cost-benefit analysis." *Id.* at 512 (emphasis added); *see also id.* at 509 ("cost-benefit analysis by OSHA is not *required* by the statute") (emphasis added). Indeed, in an unrebutted characterization of the majority opinion, Justice Rehnquist in dissent read the opinion as having plainly "suggest[ed] ... that the Act *permits* the Secretary to undertake [cost-benefit] analysis if he so chooses." *Id.* at 544 (Rehnquist, J., dissenting).[8]

Unsurprisingly, therefore, this Court has never ascribed to *American Textile* the meaning given it by the Second Circuit. Nor has any other court of appeals. To the contrary, most circuit courts have concluded that "*American Textile* would seem to be limited to the finding that ... the agency is not *required* to employ cost-benefit analysis,"[9] and that, under *Chevron*,

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[8] Even assuming this language in *American Textile* had the meaning ascribed to it by the Second Circuit, it is inconsistent with this Court's subsequent decision in *Chevron* and cannot survive it. Under *Chevron*, statutory silence is read not as a prohibition, but as delegating the decision to the agency. This principle holds equally true for cost-benefit analysis as any other issue. *See* Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 Mich. L. Rev. 1651, 1684–85 (2001) ("If Congress has not ... referred to costs, it will often be because Congress ... has not resolved the question whether costs should be considered. And if this is so, the agency is entitled to consider costs if it chooses.").

[9] *NRDC v. EPA*, 824 F.2d 1146, 1159 n.6 (D.C. Cir. 1987) (en banc) (emphasis added). The First Circuit has similarly observed that *American Textile* "held only that the statute ... did

agencies are free to weigh costs and benefits in the face of statutory silence or ambiguity.[10] The few circuit courts that have read *American Textile* to prohibit cost-benefit analysis in the OSHA context have emphasized the specific and inflexible worker safety goal set by the statute.[11]

Similar statutory language explains this Court's decision in *Whitman v. American Trucking Ass'ns*, 531 U.S. 457 (2001), which considered EPA's authority to consider costs under §109(b)(1) of the Clean Air Act, 42 U.S.C. §7409(b)(1). That provision requires EPA to set air quality standards that are "'requisite to protect the public health'" with "'an adequate margin of safety.'" 531 U.S. at 465 (citation omitted). This Court held that the language in §109(b)(1) plainly requires EPA to set the minimum standards "requisite" to achieve that goal, and that costs were irrelevant. *Id.* This Court observed that some further "textual commitment of

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not *require* ... cost/benefit analysis." *Massachusetts v. Hayes*, 691 F.2d 57, 61 n.4 (1st Cir. 1982).

[10] *See, e.g., Michigan v. EPA*, 213 F.3d 663, 678 (D.C. Cir. 2000) ("preclusion of cost consideration requires ... express congressional direction"), *cert. denied*, 532 U.S. 904 (2001); *Sierra Club v. EPA*, 375 F.3d 537, 541 (7th Cir. 2004) ("when the statute is ambiguous the EPA is free to take costs into account"); *Sierra Club v. EPA*, 314 F.3d 735, 744 (5th Cir. 2002) ("[agency] determinations based on a cost/benefit analysis are within the EPA's discretion unless the statutory scheme precludes such a determination"); *George E. Warren Corp. v. EPA*, 159 F.3d 616, 623–24 (D.C. Cir. 1998); *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 796 (6th Cir. 1995); *Consol. Rail Corp. v. United States*, 855 F.2d 78, 85–86 (3d Cir. 1988).

[11] *See, e.g., Nat'l Grain & Feed Ass'n v. OSHA*, 866 F.2d 717, 730 (5th Cir. 1989); *Bldg. & Constr. Trades Dep't, AFL-CIO v. Brock*, 838 F.2d 1258, 1264 (D.C. Cir. 1988).

authority" would be necessary to authorize cost-benefit analysis, particularly since the standards set under this provision "are the engine that drives nearly all of Title I of the [Clean Air Act]" and Congress "does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions." *Id.* at 468. This Court's discussion of a "textual commitment of authority" to consider cost was not intended to apply—and has never been applied by this Court—more broadly than with respect to that provision. To the contrary, this Court distinguished several court of appeals decisions finding "authority for the EPA to consider costs" under other provisions of the Clean Air Act, even though those provisions did not expressly provide for cost-benefit analysis. *See id.* at 469 n.1.

B. The Second Circuit's Clear Statement Rule Is Unsound And Should Be Rejected

The Second Circuit's clear statement rule not only lacks precedential support, it makes no sense. Cost-benefit analysis by agencies is *favored* by the law, not disfavored.[12] In the absence of strong contrary

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[12] It is worth contrasting the Second Circuit's clear statement rule with the presumption this Court employs in the context of the federal courts' remedial powers. Under traditional principles of equity, a court considering whether to grant injunctive relief must consider, *inter alia*, whether the "balance of hardships" favors the plaintiff. *See eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (2006). This largely entails an informal weighing of costs and benefits. *See, e.g., Walgreen Co. v. Sara Creek Prop. Co.*, 966 F.2d 273, 275 (7th Cir. 1992) (Posner, J.) ("The choice between remedies requires a balancing of the costs and benefits of the alternatives."). This Court has repeatedly held that statutes should be interpreted to permit (or even require) a court to weigh the traditional equitable factors when tailoring

evidence, the most reasonable presumption is that Congress intended to authorize it. Indeed, there are strong reasons for this Court to adopt a presumption or clear statement rule that is the *opposite* of the one employed by the Second Circuit. The Second Circuit's clear statement rule would undermine agency efforts to engage in the reasoned decisionmaking required by general principles of administrative law.

At a basic level, what respondents and the Second Circuit denigrate as "cost-benefit analysis" is nothing more than common sense—the imperative of basic rationality to ensure that actions do more good than harm. And the form employed by EPA here is exceedingly modest. EPA left a substantial thumb on the scale for environmental protection in the national standards, *see* UWAG Br. at 21 (cost-to-benefit ratio), and determined that cost considerations would moderate its BTA determinations on a site-specific basis only if the incremental costs of a particular technology or design are "*significantly* greater than" the incremental benefits. *See supra* at 3, 15. In the absence of clear direction, there is no reason to presume that Congress would want its statutes interpreted in a manner that does significantly more harm than good, and no policy reason for the law to prefer such an outcome.

In fact, "[f]or twenty-five years, American presidents have compelled administrative agencies to complete a cost-benefit analysis before enacting major rules and regulations." Stephen Clowney, Note,

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enforcement measures, unless a contrary purpose plainly appears. *See, e.g., Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311–14 (1982) (no contrary purpose in CWA); *Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 542 (1987); *eBay*, 547 U.S. at 391–92.

Environmental Ethics & Cost-Benefit Analysis, 18 Fordham Envtl. L. Rev. 105, 106 (2006); *see also, e.g.*, Matthew D. Adler, *Risk, Death & Harm: The Normative Foundations of Risk Regulation*, 87 Minn. L. Rev. 1293, 1389–90 (2003). That is unsurprising, for, other than in those rare cases where Congress has expressly prohibited a weighing of costs and benefits, it may be arbitrary and capricious under the Administrative Procedure Act ("APA"), 5 U.S.C. §706(2), for an agency to promulgate a rule without doing so. "[A]ny reasonable judgment will ordinarily be based on some kind of weighing of costs and benefits, not on an inquiry into benefits alone." *Cost-Benefit Default Principles* at 1694, *supra* at 26 n.8; *see also id.* at 1668 ("Unless Congress has clearly said otherwise, agencies will be expected to balance costs against benefits in issuing regulations.").

EPA, like other agencies and in coordination with other agencies, must implement discrete statutory provisions in light of multiple regulatory goals that place competing demands on administrative and industry resources and, in some instances, may conflict. In *Chevron U.S.A. Inc. v. Echazabal*, 536 U.S. 73, 85 (2002), this Court recognized "the substantive choices that agencies are expected to make when Congress leaves the intersection of competing objectives both imprecisely marked but subject to administrative leeway." And in the landmark *Chevron* decision, this Court observed that agencies frequently must make "policy choices" to reconcile "the competing interests which Congress itself either inadvertently did not resolve, or intentionally left to be resolved by the agency charged with the administration of the statute in light of everyday realities." 467 U.S. at 865–66; *see*

also ICC v. Or. Pac. Indus., Inc., 420 U.S. 184, 193 n.2 (1975) (Powell, J., concurring) (agencies "mak[e] ... decision[s] reasonably accommodating diverse and often competing public interests"). A weighing of costs and benefits preserves resources for competing priorities and provides a framework for managing conflicting policies.

Finally, site-specific determinations grounded in cost-benefit balancing, such as the one included in the Phase II rule, help guard against the disruptive effect of a one-size-fits-all regulation. This approach, as noted above, is particularly important for existing facilities, which are more technically, physically, and geographically constrained than new facilities. *See supra* at 14–15; Pet.App.248a (69 Fed. Reg. at 41,603).[13]

II. THE ONLY REASONABLE INTERPRETATION OF §316(b) PERMITS EPA TO WEIGH COSTS AND BENEFITS AT THE NATIONAL AND LOCAL LEVEL

Once the Second Circuit's unsound clear statement rule is set aside, its radical interpretation of §316(b) must be rejected even at the first step of the *Chevron* analysis. The statutory language is clearly expansive enough to permit a reasonable weighing of costs and benefits. And when the broader structure and

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[13] *See Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 350 (5th Cir. 1981). This flexible approach is critical for regulations involving essential national services, such as power generation. As here, agencies can develop more stringent national standards, secure in the ability to moderate their effects in particular local cases where the costs of compliance would substantially outweigh the benefits. *See supra* at 14–15, 29.

purposes of the statute, traditional canons of construction, and legislative history are considered, it becomes clear that an interpretation authorizing EPA to engage in cost-benefit analysis is the only reasonable reading. *See, e.g., Nat'l Ass'n of Home Builders v. Defenders of Wildlife*, 127 S. Ct. 2518, 2534 (2007) (at *Chevron* step one, a court "'should not confine itself to examining a particular statutory provision in isolation.' ... Rather, '[t]he meaning—or ambiguity—of certain words or phrases may only become evident when placed in context ....'") (citations omitted) (alteration in original).

A. The Ordinary Meaning Of The Phrase Congress Used In §316(b) Permits Cost-Benefit Analysis

The Second Circuit's conclusion that §316(b) "precludes cost-benefit analysis" (Pet.App.24a), both nationally and on a site-specific basis, is based on what the court believed to be the only literal and therefore reasonable interpretation of §316(b). But even if §316(b) is considered in isolation (and of course it cannot be), the dictionary and common usage point to only one plausible reading of the clause: the "best technology available for minimizing adverse environmental impact" does not have to be the one that impinges or entrains the fewest fish without imposing financial burdens the industry cannot bear.

First, the word "best" means "[m]ost satisfactory, suitable or useful; most desirable." *American Heritage Dictionary* 178 (3d ed. 1992). It often means the superlative of "good," but it also means the most *productive* of good—in the sense of what is optimal for achieving an end result. *Black's Law Dictionary* 160

(6th ed. 1990), for example, defines "best" to mean "[o]f the highest quality; of the greatest usefulness for the purpose intended. Most desirable, suitable, useful, or satisfactory," and goes on to explain:

> For example, the "best bid" of interest by a prospective depository of school funds would not necessarily be the highest bid, but, looking to the solvency of the bidder, the bond tendered, and *all the circumstances surrounding the transaction*, the safety and preservation of the school fund, the "best bid" might be the lowest bid.

Id. (emphasis added).

The word "best" is therefore perfectly consistent with the need to balance multiple, complex goals. Even in the specific CWA context, courts have recognized that the "best" pollution control technology is not necessarily the technology that reduces pollution the maximum amount. "'[T]he CWA's requirement that EPA choose the "best" technology does not mean that the chosen technology must be the best pollutant removal.'" *Citizens Coal Council v. EPA*, 447 F.3d 879, 903 (6th Cir. 2006) (en banc) (quoting *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 796 (6th Cir. 1995)). Instead, the word "best" is used to characterize standards that "'must be acceptable on the basis of numerous factors, only one of which is pollution control.'" *Id.* (quoting 66 F.3d at 796); *see also E. I. Du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 121 (1977) (for "'best practicable' or 'best available' technology ... [the CWA] refers to §304 for a definition of these terms").

Second, even the Second Circuit recognized that the word "available" gives EPA authority—indeed a mandate—to consider economic costs when selecting BTA. Determining just how absurdly expensive a technology must be before it is no longer realistically "available" calls for a substantial exercise of discretion. The Second Circuit held that EPA could reject technology requirements as "unavailable" only if the costs exceeded the maximum financial burden the industry as a whole could bear. Pet.App.24a. But nothing about the plain meaning of that word limits EPA's consideration of "availability" to the industry's ability to absorb exorbitant costs regardless of the benefit. Congress has repeatedly given "available" a broader meaning in the CWA to allow the balancing of diverse economic, environmental, and technological considerations—including three times using combinations of the words "best," "technology," and available" to create CWA standards that either permit or mandate more robust cost-benefit analysis. *See supra* at 7–11.

Third, the word "minimize" does not always mean "eliminate" or even "eliminate to the maximum extent feasible." "Minimize" frequently just means "reduce." *American Heritage Dictionary* 1150 (3d ed. 1992). If I resolve to "minimize" my gasoline consumption this summer, I am not committing never to drive my car, or to drive my car only in emergencies. I am committing to reduce my gasoline usage by some unspecified amount, implicitly balanced against other goals and values. Similarly, the *American Heritage Dictionary* observes that "[w]hen a manager announces that ['] The company wants to *minimize* the risk of accidents to line workers,['] we naturally interpret the manager as

meaning that the risk is to be reduced to the smallest level consistent with considerations of efficiency and cost"—"*not ... to the lowest level logically possible.*" *Id.* (emphasis added and omitted).

Congress has also used "minimize" in contexts where it cannot have intended the Second Circuit's maximalist interpretation. For example, it ordered the executive branch to "minimize the paperwork burden for individuals" and "minimize the Federal information collection burden," but it obviously did not mean to require the elimination of tax forms or background checks for federal employees. 44 U.S.C. §§3501(1), 3504(c)(3). Similarly, in the CWA Congress set a goal of the "drastic minimization of paperwork," but it did not intend to eliminate paperwork to the maximum extent technologically feasible (or, for that matter, for the word "drastic" to be grammatically nonsensical). 33 U.S.C. §1251(f). And in the sparse legislative history of §316(b) itself, Representative Clausen quoted the "minimize" language and then immediately stated that it required only technology that could be implemented at an "economically practicable cost." 118 Cong. Rec. 33,762 (1972); *see supra* at 7. Moreover, interpreting "minimize" as "reduce" is consistent with this Court's usage of the word. *See, e.g., Consolo v. Fed. Maritime Comm'n*, 383 U.S. 607, 621 (1966) (reasoning that the APA's deferential standards of review "minimize the opportunity for reviewing courts to substitute their discretion for that of the agency," although of course that "opportunity" could be further reduced by even more deferential standards).

Finally, the phrase "adverse environmental impact" is not synonymous with impingement and entrainment but reflects an inherently broad delegation of authority

to EPA to consider what kinds of effects, and at what level, genuinely have an "adverse impact" on the "environment" in a particular context. Nothing in the Clean Water Act establishes a goal of ensuring the survival of every possible fish. To the contrary, the Act in numerous sections (including §316(a), 33 U.S.C. §1326(a)) limits compliance burdens on industry so long as the "protection and propagation of a *balanced population* of shellfish, fish, and wildlife" is assured. 33 U.S.C. §1311(g)(2)(C) (emphasis added); *see also id.* §1311(h)(2), (m)(2); *id.* §1314(a)(5)(A), (a)(5)(B), (*l*)(1)(A); *cf. id.* §1251(a)(2). Even the Act's provisions governing *toxic pollutants* direct EPA to consider "the importance of the affected organisms" in the local ecosystem. 33 U.S.C. §1317(a)(1), (2). The Second Circuit's reading of §316(b) would mandate enormous burdens, without any weighing of costs and benefits, to save as many fish as possible when that objective was never adopted by Congress or EPA.

Thus, the "*best* technology available for minimizing adverse environmental impact" may be the most suitable or desirable technology available for reducing such impact, to whatever extent the decisionmaker believes appropriate in light of competing values. And, based on a balancing of competing values, BTA for "minimizing adverse environmental impact" may not be the one that impinges or entrains the fewest fish. Similarly, Congress did not take the absolutist approach of requiring EPA to "eliminate" any particular impacts associated with intake structures, as it did for pollutant discharges under §§301 and 306. *See* 33 U.S.C. §1311(b)(2)(A) ("national goal of *eliminating* the discharge of *all pollutants*") (emphasis added); *accord id.* §1311(b)(3) (requiring EPA to "identify

control measures ... available to eliminate the discharge of pollutants"); *id.* §1251(a)(1). Congress chose the far more flexible term "minimizing," which allows EPA to determine the degree of reduction appropriate. *Cf. Grand Canyon Air Tour Coal. v. FAA*, 154 F.3d 455, 475 (D.C. Cir. 1998) (permitting agency to consider economic impacts where "Congress ... required 'substantial restoration of the natural quiet,' not total restoration"), *cert. denied*, 526 U.S. 1158 (1999).

B. The Structure Of The Act Confirms EPA's Interpretation

If the bare language "best technology available for minimizing adverse environmental impact" leaves any doubt about the permissibility of cost-benefit analysis, it is dispelled by the relationship of §316(b) to other sections of the Act. "A court must ... interpret the statute 'as a symmetrical and coherent regulatory scheme,' and 'fit, if possible, all parts into an harmonious whole.'" *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 133 (2000) (citations omitted). Here, reading §316(b) in the context of the entire CWA—a statute described by this Court as one "in which Congress envisioned, rather than curtailed, the exercise of discretion"—confirms that §316(b) authorizes EPA to compare the costs of technologies to their environmental benefits in selecting BTA. *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 316 (1982).

1. Sections 301 And 306 Either Mandate Or Permit Cost-Benefit Analysis

All parties to this case,[14] the Second Circuit, and the other courts of appeals to have considered the issue agree that "best technology available" standard in §316(b) should be interpreted and applied in a manner informed by the "best technology" standards in CWA §§301 and 306. The brevity of §316(b), the linguistic similarity of BTA to the other "best technology" standards, the cross-reference to those other provisions, and the fact that Congress did not separately provide for civil or criminal enforcement of violations of §316(b), *see* 33 U.S.C. §1319, all reinforce the conclusion that Congress intended to incorporate the comprehensive decisional framework established by §§301, 304, and 306. Respondents contend, however, that EPA lacks authority to compare costs and benefits under §301's BAT standard, and that the BTA requirement in §316(b) should be interpreted consistently with this constrained view of BAT.[15]

As an initial matter, respondents' premise is simply incorrect. *All* of the "best technology" standards under

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[14] *See, e.g.*, Riverkeeper Second Cir. Supp. Br. at 50 ("EPA's authority for *considering* compliance costs ... comes from the cross-reference in section 316(b) to sections 301 and 306.") (emphasis added); States Opp. to Cert. at 7–8 (arguing that the Second Circuit properly "rejected the cost-benefit analysis because it was precluded ... by the plain language of the cross-referenced sections").

[15] Environmental respondents have taken conflicting positions on this issue. They previously conceded that in setting national standards EPA "can, and did, consider costs in relation to benefits." Riverkeeper Second Cir. Opening Br. at 93.

§§301 and 306, *including* BAT, authorize EPA to consider costs of compliance as well as environmental benefits. For some of the "best technology" standards, Congress specified that costs were a mandatory "comparison factor." Congress mandated in §304 that EPA's assessment of BPT "include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." 33 U.S.C. §1314(b)(1)(B). It is undisputed that EPA was *required* to conduct a comparison of costs and benefits when setting BPT. *See, e.g.*, Pet.App.21a; States Opp. to Cert. at 7–8; Riverkeeper Second Cir. Reply Br. at 115. The BCT standard for conventional pollutants—which respondents and the Second Circuit have ignored—similarly requires EPA to evaluate "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. §1314(b)(4)(B); *see supra* at 10.

When §§301, 304 and 306 do not *require* cost-benefit analysis as a mandatory "comparison factor," those provisions still expressly grant EPA authority to consider costs and benefits as discretionary "consideration factors." Even under the BAT standard EPA "shall take into account ... the cost of achieving such effluent reduction" as well as "such other factors as the Administrator deems appropriate." 33 U.S.C. §1314(b)(2)(B). The primary difference between the statute's treatment of BPT and BAT is that, under BAT, "[a]ll factors, including costs and benefits, are [discretionary] consideration factors, and no factors are

separated out for [mandatory] comparison." *Weyerhaeuser*, 590 F.2d at 1045.[16]

As the D.C. Circuit has observed, for BAT "Congress did not mandate any particular structure or weight for the many consideration factors," but instead "left EPA with discretion to decide how to account for the consideration factors, and how much weight to give each factor." *Id.* Thus, §304 "on its face lets EPA relate the various factors as it deems necessary." *Id.* at 1046. One obvious—and clearly permissible—way to give costs and benefits weight and "relate" them to each other is to perform a cost-benefit analysis. The "such other factors as the Administrator deems appropriate" language in §304 underscores the broad discretion granted to EPA in determining what technology is "best" in particular contexts. The D.C. Circuit has correctly observed that, because of this language, the CWA provisions "cannot logically be interpreted to impose on EPA a specific structure of consideration or set of weights because it gave EPA authority to 'upset' any such structure by exercising its discretion to add new factors to the mix."[17] *Id.*

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[16] Congress provided a "virtually identical" structure for BADT standards under §306. *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1059 (3d Cir. 1975). In setting BADT under §306, Congress required that EPA "shall take into consideration *the cost of achieving such effluent reduction*, and any non-water quality environmental impact and energy requirements." 33 U.S.C. §1316(b)(1)(B) (emphasis added).

[17] *Cf. Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 489, 494–95 (1987) (holding that the CWA preempted state nuisance law where the NPDES permit program—the same program through which EPA establishes §316(b) BTA requirements—is designed

Recognizing this significant flexibility, the Sixth Circuit has expressly held that EPA is permitted to use cost-benefit analysis in setting BAT. *BP Exploration*, 66 F.3d at 796. That court endorsed the D.C. Circuit's reasoning that the BAT "consideration factors" give EPA "'discretion to decide how to account for the consideration factors, and how much weight to give each factor'"—and thus to compare costs in relation to benefits. *Id.* (*quoting Weyerhaeuser*, 590 F.2d at 1045). Other circuits have held that cost-benefit analysis is not *required* under the BAT provisions, but until now no court has ever held that such analysis is forbidden.[18] The Second Circuit itself previously understood this statutory structure. In *Riverkeeper I*, it relied on *Weyerhaeuser* and *BP Exploration* to hold that cost-benefit analysis was permissible *under §316(b) itself*. *See* 358 F.3d at 195 (quoting *BP Exploration* and *Weyerhaeuser*).

The court's contrary reading of §§301 and 316(b) in this case rests in part on a misreading of a single sentence in this Court's pre-*Chevron* opinion in *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64 (1980). Pet.App.21a–23a. This Court held in *Crushed Stone* that EPA was not *required* to provide a variance for individual facilities that could not afford to meet BPT effluent standards. This Court reasoned in part that

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for EPA's "weighing of costs and benefits" in establishing effluent limitations, and state law would circumvent those considerations).

[18] *See, e.g., Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 559, 563 (D.C. Cir. 2002); *Rybachek v. EPA*, 904 F.2d 1276, 1290–91 (9th Cir. 1990); *Am. Petroleum Inst. v. EPA*, 787 F.2d 965, 972 (5th Cir. 1986); *Reynolds Metal Co. v. EPA*, 760 F.2d 549, 565 (4th Cir. 1985); *CPC Int'l, Inc. v. Train*, 540 F.2d 1329, 1341–42 (8th Cir. 1976); *Am. Iron & Steel Inst.*, 526 F.2d at 1059.

the BPT standards were supposed to reflect the "prescribed minimum technology," and that the statute already required EPA to weigh costs against benefits when setting those standards. 449 U.S. at 76–77. When distinguishing the BAT provisions, which include a variance for individual plant economic affordability, this Court observed that "in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits." *Id.* at 71. But this Court clarified that the BAT provision "lists 'cost' as a factor to consider in assessing BAT, although it does not state that costs shall be considered in relation to effluent reduction." *Id.* at 71 n.10. In other words, Congress made cost-benefit analysis *mandatory* for BPT but only optional for BAT—which helped justify deference to EPA's distinction between the two. This Court certainly did not hold that EPA was *forbidden* from considering costs in setting BAT standards, as subsequent courts have recognized. *See Tex. Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 936 (5th Cir. 1998) ("EPA is *not obligated* to evaluate ... the relationship between costs and benefits" under BAT) (emphasis added) (citing *Crushed Stone*, 449 U.S. at 71).

2. The Second Circuit's Rigid Analogy To BAT Standards Is Inappropriate

Even if this Court were to conclude that §§301 and 304 of the CWA place significant constraints on EPA's discretion to consider costs when setting BAT standards, there is no sound basis for importing those constraints into §316(b). This Court has recognized that even though the CWA imposes "absolute" requirements in certain contexts, overall it "is a statute in which Congress envisioned, rather than curtailed,

the exercise of discretion." *Weinberger*, 456 U.S. at 316 & n.11 (distinguishing constraints recognized in *Crushed Stone* and holding that CWA violations do not necessarily require injunctive relief).

As EPA recognized in the Phase II rule when distinguishing §316(b) from the effluent limitation provisions, "the object of the 'best technology available' [in §316(b)] is explicitly articulated by reference to the receiving water: To minimize adverse environmental impact in the waters from which cooling water is withdrawn." Pet.App.157a (69 Fed. Reg. at 41,583). The BAT standard has the very different statutory goal of "eliminating the discharge of all pollutants." 33 U.S.C. §1311(b)(2)(A). The content of each CWA technology standard is necessarily tied to the statutory goal it is intended to advance. *See Crushed Stone*, 449 U.S. at 77 (recognizing the close relationship between the technology standard and the statutory goal, where the variance sought would have "allow[ed] a level of pollution inconsistent with the judgment of the Administrator"); *id.* at 75 n.14.

The Second Circuit focused on BAT because of its superficial "linguistic similarity" with BTA, but failed to recognize the important differences in the phrasing, purpose, and regulatory context of those two standards. Even if the Second Circuit were correct that Congress intended for BAT standards to be "technology-forcing" in some sense, §316(b) embodies no comparable policy.

Congress's amendments to §301 also illustrate the flaw in the Second Circuit's conflation of BTA with the BAT standard. The Second Circuit assumed that the original Act's scheduled shift from BPT to BAT

signaled an intent by Congress to elevate technological performance above all else. Pet.App.21a, 24a. But that ignores the subsequent history of the Act, under which Congress substantially modified §301 to make the BAT standard applicable to a much narrower range of effluents. *See supra* at 9–11. Under the 1977 amendments, so-called "conventional" pollutants need only comply with the BCT standard, which affirmatively *requires* EPA to weigh "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. §1314(b)(4)(B). Congress also added §301(g), which permits EPA to exempt some non-conventional, non-toxic pollutants from the BAT standard and regulate them under the even less stringent BPT standard. *See* 33 U.S.C. §1311(g)(2)(A).

After the 1977 and 1987 amendments, the BAT standard is principally confined to the regulation of potentially lethal toxic pollutants discharged into the Nation's waters. 33 U.S.C. §1362(13) (toxic pollutants are those "which after discharge and upon exposure ... will ... cause death," among other serious harms). Other pollutants are eligible for consideration under standards *requiring* a weighing of costs and benefits. *See supra* at 7–11. Under the Second Circuit's reading, EPA therefore must analyze impingement and entrainment under a standard that Congress thought too stringent for the release of *pollutants* that pose risks to *human health*, let alone to fish. The Second Circuit's assumption that Congress would have wanted that standard to be applied to cooling water intake structures in a rigid and "technology-forcing" way, even though the statute now permits variances from

BAT even for toxic pollutants in certain circumstances, is simply unreasonable.

That risks to fish from impingement and entrainment are poorly analogized to toxic and other dangerous pollutants is further confirmed by Congress's decision to place cooling water intake structure requirements in §316, which generally deals with the more modest risks posed by *thermal* pollution. Thermal discharges are generally regulated as a non-conventional, non-toxic pollutant subject to the discretionary variance provision of §301(g) and a special variance provision in §316(a), 33 U.S.C. §1326(a). The §316(a) variance requires EPA to relax its regulations for a particular facility if the facility shows that the regulations are "more stringent than necessary to assure the projection [protection] and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made." 33 U.S.C. §1326(a).

Indeed, to the extent that §316(b) might be viewed as principally concerned with the protection of fish (even though, of course, "minimizing adverse environmental impact" is much broader), Congress has never extended to risks to individual fish the same level of concern it has displayed for pollutants dangerous to humans. Given the care with which Congress structured the entire Act to ensure that disproportionate expenditures are not required to protect aquatic life, see *supra* at 7–11, 36, it strains credulity to imagine that it would have opened the door, through a provision that the Second Circuit twice characterized as an "afterthought," to regulations requiring massive expenditures on behalf of fish for no

appreciable benefit.[19] Such a reading of §316(b) would inappropriately "alter the fundamental details of a regulatory scheme in ... [an] ancillary provision[]." *Am. Trucking*, 531 U.S. at 468; *supra* at 27–28. And, as this Court has repeatedly cautioned, Congress does not "hide elephants in mouseholes." *Am. Trucking*, 531 U.S. at 468.

3. The Water Quality Policies Of The Act Do Not Support The Second Circuit's Rejection Of Cost-Benefit Analysis

The Second Circuit also reasoned that any effort to weigh costs and benefits on a site-specific basis would inevitably draw permitting authorities into "consideration of the quality of the receiving water," which the court believed would be inconsistent with the broader policies of the Clean Water Act. Pet.App.56a–60a. The Second Circuit's reservations about site-specific cost-benefit analysis are misplaced.

The plain language of §316(b) strongly suggests that BTA should be determined at the facility level, particularly for existing facilities. It is hard to imagine

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[19] For example, the Second Circuit's reading would require a radically and arbitrarily different approach to the effects of a cooling system's intake and its outflow. Under §316(a), harm to individual fish from the thermal discharges of a "once-through" cooling system may be disregarded so long as the discharge does not threaten the protection and propagation of a balanced population of fish. Under the Second Circuit's reading of §316(b), however, such a facility might nonetheless be required to rip out that same cooling system and replace it with, *e.g.*, a wet closed-cycle system, based solely on a showing that it would save some extra fish, without any showing that the impingement or entrainment of those fish threatens a balanced population.

how the optimal "location" or even "design, and construction" of cooling water intake structures could be specified at a national level, without regard to the geographic and waterbody characteristics at particular facilities. *See* Pet.App.157a (69 Fed. Reg. at 41,583) (EPA discussing consideration of "effects on and benefits to" the local waterbody); Pet.App.229a (69 Fed. Reg. at 41,599 (explaining that "[b]ecause different waterbody types have the potential for different ... impacts, the requirements ... vary by waterbody type.").[20] And, as explained in greater detail in the brief filed by UWAG, both the costs and the environmental benefits of particular intake structure technologies can vary dramatically from facility to facility. *See* UWAG Br. at 6-11. In at least some cases, the only sensible way to identify the "best" available technology will be to weigh costs and benefits in a site-specific manner.

The Second Circuit appears to be concerned that it would be inappropriate for a permitting authority to conclude that the costs of a better intake technology significantly outweigh the benefits only because the waterbody is already artificially degraded from its natural state in a manner that a better intake system might have helped to remedy. Pet.App.58a–59a. Even

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[20] Perhaps for this reason, §316(b), unlike the effluent discharge requirements in §§301 and 306, does not require that facilities "implement" a particular technology, but only that the "the location, design, construction, and capacity of cooling water intake structures *reflect*" that technology. That structures "reflect" a technology is a far more ambiguous mandate than one requiring that facilities "implement" that technology, and one with ample room for variations and alternative requirements where justified by local circumstances.

if such concerns were valid they do not remotely justify precluding site-specific cost-benefit analysis altogether, including appropriate consideration of site-specific waterbody characteristics. The Second Circuit's reasoning would require EPA to close its eyes to the fact that some waterbodies *naturally* support ecosystems that are robust, or abnormally meager, enough to affect the "best" choice of intake technology.

The Second Circuit also reasoned that site-specific cost-benefit analysis is inappropriate because §316(a) explicitly authorizes variances from thermal discharge limitations if those limits "will require effluent limitations more stringent than necessary to assure the projection [protection] and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made"—whereas §316(b) contains no similar language. *See* 33 U.S.C. §1326(a), (b); Pet.App.59a n.27. That reasoning is flawed. While §316(b) does not explicitly contain a variance procedure, it directs regulators to consider the "impact" of the "location, design, construction, and capacity" of cooling water intake structures. 33 U.S.C. §1326(b). As explained above and in UWAG's brief, this analysis inherently calls for some consideration of site-specific issues. *See supra* at 14–15; *see* UWAG Br. at 6-11, 42-57.

In any event, EPA's authority to weigh costs and benefits at the site-specific level need not be grounded in a single provision, but may reflect the Agency's inherent authority to select "a mechanism for ensuring that its necessarily rough-hewn categories do not unfairly burden atypical plants." *Chem. Mfrs.*, 470 U.S. at 120 (affirming EPA's authority to "temper[] with flexibility" otherwise categorical pretreatment

standards); *Du Pont*, 430 U.S. at 128 (1977) (concluding that BPT and BAT limitations may "be set by [national] regulation" "so long as some allowance is made for variations in individual plants, as EPA has done").

C. The Second Circuit's Interpretation Has Consequences Congress Could Not Have Intended

For all of the reasons given above, it is simply not plausible that Congress intended to mandate the maximum possible reduction in impingement and entrainment without allowing EPA to balance costs against benefits. Indeed, such an interpretation of the Act flirts with absurdity.

First, a campaign to eliminate impingement and entrainment of fish, to the maximum extent possible without regard to cost, is self-evidently unsound policy. Although EPA chose reductions in impingement mortality and entrainment as a "convenient" metric for determining performance at Phase II facilities (Pet.App.290a, 169a (69 Fed. Reg. at 41,612, 41,586)), neither the statutory language nor sound environmental policy justify the Second Circuit's fixation on saving every possible fish. Fish and other aquatic creatures often produce many thousand times more offspring than the available ecosystem resources can support, expecting high natural mortality in the early life stages.[21] Moreover, when a waterbody is

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21 *See, e.g., Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306, 309 (1st Cir. 1979) (noting that "[t]hough the intake would act as an additional large predator, there are other more dangerous threats in the natural environment, which fish are able to survive because they are highly fecund. For instances,

either highly robust or naturally lacking aquatic life that is susceptible to impingement or entrainment (like the Dead Sea or the Great Salt Lake), moderate levels of impingement and entrainment may have no consequences for the marine ecosystem that are remotely worth massive technology costs. The Second Circuit's interpretation would compel EPA to order refits that are enormously expensive symbolic gestures devoid of any meaningful environmental consequence.

Second, the Second Circuit's interpretation also presumably requires EPA to require intake designs and construction methods that eliminate, to the maximum extent possible, *all* "adverse environmental impact," so long as the industry can reasonably bear the costs. Pet.App.26a. As explained above, "adverse environmental impact" encompasses far more than impingement mortality and entrainment, and may also include the fogging, icing, consumptive water usage, and noise associated with closed-cycle cooling, as well as increased air emissions from greater fuel consumption. *See supra* at 5–6. Indeed, it could extend to "impacts" such as atmospheric carbon dioxide produced in the manufacturing and transporting of building materials used in the "construction" of intake structures. Congress could not have intended to require EPA to consider, and reduce to the maximum extent possible, every far-flung environmental impact associated with the design and construction of a cooling water intake structure *while intentionally blinding*

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individual female winter flounder produce about 500,000 eggs annually and rainbow smelt produce between 25,000 and 50,000.") (citation omitted).

itself to whether the costs significantly exceed the benefits.

Third, the cost burdens imposed by the Second Circuit's interpretation are potentially limitless in light of EPA's decision to implement §316(b) through the NPDES permitting process, which operates on a five-year cycle.[22] As new technologies are developed, it is possible—indeed likely—that the maximally-effective technology may change over the course of a permitting cycle. This is problematic because cooling water intake structures often require tons of concrete and steel in the ground or underwater.[23]

Moreover, both the type of cooling system and the amount of cooling water used affect a facility's layout and operation, not to mention energy output. Yet, under the Second Circuit's interpretation of §316(b) and the Phase II rule, EPA and state permitting authorities presumably would have to reevaluate such structures every five years, then mandate any new improvements that will significantly reduce impingement mortality and entrainment—without regard to the aggregate costs of such a fickle regulatory policy (as long as the industry can bear them), or any facility-specific difficulties in implementation (such as if the ideal location for a state-

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[22] Congress did not specify any permitting process for §316(b), and there are good reasons to believe it intended for §316(b) requirements to be implemented only once, at a facility's initial construction. *See supra* at 12 n.4. This Court elected not to review that issue.

[23] The structure considered by the First Circuit 30 years ago in *Seacoast*, for example, involved piping structures drawing seawater from over a mile out in the ocean. 597 F.2d at 309.

of-the-art intake is occupied by other vital facility infrastructure). *Cf.* 33 U.S.C. §1316(d) (new facilities, but not existing facilities, are protected from more stringent effluent standards for 10 years). Besides the exorbitant costs, retrofits are extremely time-consuming, potentially resulting in facilities being taken offline for significant periods of time, with obvious consequences for the stability of electric supplies. J.A.312; J.A.343–44; Pet.App.258a-59a (69 Fed. Reg. at 41,605). There is no evidence in the language or history of §316(b) indicating that it was meant to require such a Sisyphean task.

Congress cannot possibly have intended these results. Since the language is easily broad enough to encompass consideration of costs as well as benefits, and the overall language, structure, and legislative history of the Clean Water Act reflect a strong commitment to cost-benefit analysis rather than hostility to it, the Second Circuit's extreme reading of this one isolated provision is clearly inappropriate. Indeed, the reading is so absurd as to require its rejection even if the plain language did—though it does not—appear to require it. *See, e.g., Logan v. United States*, 128 S. Ct. 475, 484 (2007) ("Statutory terms ... may be interpreted against their literal meaning where the words 'could not conceivably have been intended to apply' to the case at hand." (citation omitted)); *Pub. Citizen v. U.S. DOJ*, 491 U.S. 440, 470 (1989) (Kennedy, J., concurring in the judgment) (such a rule "demonstrates a respect for the coequal Legislative Branch, which we assume would not act in an absurd way").

D. The Legislative History Confirms That §316(b) Permits Cost-Benefit Analysis

The absence of any congressional intent in §316(b) to force technology irrespective of costs and benefits is confirmed by the Act's legislative history. Representative Clausen, a Floor Manager, explained that "'best technology available' is intended to be interpreted to mean the best technology available commercially at an economically practicable cost." *See supra* at 7.

The legislative history of the thermal discharge provisions of §316 reflects a similar congressional understanding that EPA (and state regulators) would weigh the costs of any implementing regulations against the benefits of such technology forcing to fish and other wildlife. In discussing Congress's goal in enacting §316, Representative Clark—a member of the House Committee on Public Works and sponsor of the amendment to H.R. 11896 relating to thermal discharges—stated:

> [T]he [EPA] Administrator has shown an unfortunate tendency sometimes in the past to require ridiculous expenditures of hundreds of millions of dollars with no benefit to any persons, or even to the fish. The purpose of the language in sections 304, 306, *and 316* is to require the Administrator to utilize better judgment in the future.

118 Cong. Rec. 33,765–66 (1972) (emphasis added).

Conference managers from both the House and Senate also recognized that the bill would not fulfill its

objectives if it imposed unreasonable costs. Senate Debate on S. 2770 (Nov. 2, 1971), *reprinted in* 2 Legislative History of the Water Pollution Control Act Amendments of 1972, at 1272 (Comm. Print 1973) ("Legis. Hist.") (statement of Sen. Randolph, Chairman of the Conference Committee and Chairman of the Committee on Public Works) ("under the proposed legislation, controls must relate the economic and social benefits to be gained with the economic and social costs to be incurred"). As explained by Senator Bentsen:

> If these programs cause too severe economic dislocations, if the economic and social benefits of pollution control programs bear no reasonable relationship to the costs involved in implementing them, then all of our best efforts to clean up the waterways could be defeated in a backlash against those of us who are working to clean up the environment.... *There must be a reasonable relationship between costs and benefits* if there is to be an effective and workable program.

Id. at 1281 (emphasis added); *see also id.* at 1278 (statement of Sen. Montoya, member of the Committee on Public Works) ("I would point out ... that the bill will allow reason to be applied when the benefits of attaining clean water are clearly and significantly out of line with the costs involved ....").

III. AT A MINIMUM, §316(b) IS AMBIGUOUS AND EPA'S INTERPRETATION IS REASONABLE AND ENTITLED TO DEFERENCE

As explained above, the only reasonable reading of §316(b) is that the statute expressly delegates to EPA discretion to consider the relationship between costs and benefits when selecting the "best technology available for minimizing adverse environmental impact." At worst, however, the statute is ambiguous or silent on this critical point, particularly considering the broader statutory context.[24] Indeed, the Second Circuit essentially conceded that the statute was at least ambiguous; rather than stopping at step one of *Chevron*, it held that EPA's interpretation "was not 'based on a permissible construction of the statute'" Pet.App.36a (quoting *Chevron*, 467 U.S. at 843). EPA's construction of the statute is plainly reasonable, and entitled to deference.

First, respondents and the Second Circuit have conceded that §316(b) permits consideration of costs in some manner. They have simply attempted to impose exceptionally detailed and cramped restrictions on exactly *how* EPA may analyze costs under §316(b). For example, if EPA had determined that industry could "reasonably bear the price of technology" that saves 100-105 fish, the Second Circuit would allow EPA

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[24] *See Zuni Pub. Sch. Dist. No. 89 v. Dep't of Educ.*, 127 S. Ct. 1534, 1546 (2007) ("'[A]mbiguity is a creature not [just] of definitional possibilities but [also] of statutory context.") (citation omitted) (final two alterations in original); *Brown & Williamson*, 529 U.S. at 132 ("The meaning—or ambiguity—of certain words or phrases may only become evident when placed in context.").

to choose as BTA a technology that saves 99-101 fish for $100 instead of one that saves 100-103 fish but costs 50% more ($150) for this incremental benefit. Pet.App.27a–28a. But EPA could *not* choose the cheaper technology saving up to 101 fish if it had first determined that the industry could bear the price of technology that could save "at least 102 fish." Pet.App.28a. In essence, respondents and the Second Circuit believe that §316(b) affirmatively authorizes the consideration of costs, but drastically constrains how EPA may *weigh* this criterion—unlike all other "consideration factors" under the CWA. As the United States has explained, the Second Circuit's holding would "micro-manage the agency's decisionmaking by establishing rules that cannot be found anywhere in the Act." U.S. Opp. to Cert. at 12.

Second, in the absence of statutory language clearly signaling congressional disapproval, cost-benefit analysis is *always* reasonable. Cost-benefit analysis (and particularly the modest form employed by EPA here) is essentially just another way of describing common sense or basic rationality. *See supra* at 26–31 & n.10. Assuming from §316(b)'s *ambiguous* language that Congress did not intend for its efforts to do more harm than good is, at a minimum, a permissible interpretation. *See, e.g., Arkansas v. Oklahoma*, 503 U.S. 91, 105, 107 (1992) (reversing where CWA did not limit EPA's authority on a permitting question and EPA's interpretation was a "reasonable exercise of [its] substantial statutory discretion").

Third, where an agency's interpretation "closely fits 'the design of the statute as a whole,'" courts "should be especially reluctant" to reject it. *Good Samaritan Hosp. v. Shalala*, 508 U.S. 402, 417–18 (1993) (citation

omitted). The Act clearly grants EPA significant authority to consider costs and to provide reasonable variances even in the context of toxic pollutants. *See supra* at 7–11. When it mentions fish at all, it consistently expresses a policy of protecting balanced populations of fish—not, as the Second Circuit assumed, *individual* fish. EPA's interpretation of §316(b) as permitting a weighing of costs and benefits in setting national BTA standards, as well as with site-specific determinations based on further cost-benefit analysis at the local level, is reasonable and consistent with the Act's approach towards the protection of fish. The Second Circuit's approach, conversely, places fish and other aquatic organisms on a pedestal never erected by Congress.

Finally, this Court "'normally accord[s] particular deference to an agency interpretation of "longstanding" duration,' recognizing that 'well-reasoned views' of an expert administrator rest on 'a body of experience and informed judgment to which courts and litigants may properly resort for guidance.'" *Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 487 (2004) (citations omitted). The long-standing nature of EPA's reliance on cost-benefit analysis in applying §316(b) is beyond dispute,[25] and Congress has

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[25] Since at least 1977, EPA has compared costs and benefits in making BTA determinations. *See, e.g., In re Pub. Serv. Co. of N.H., supra* at 11, *aff'd after remand, Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306 (1st Cir. 1979). EPA discussed this long history in the Phase II rulemaking, referring to the "'wholly disproportionate' cost-benefit test that has been in use since the 1970s." 67 Fed. Reg. 17,222, 17,224 (Apr. 9, 2002); *see also* Pet.App.157a (69 Fed. Reg. at 41,583). Furthermore, in *Seacoast* the First Circuit affirmed EPA's decision without expressing any reservations as to EPA's "wholly disproportionate" standard. 597

never amended §316(b) to prohibit EPA from comparing costs to benefits, nor has it otherwise expressed disapproval of EPA's cost-benefit approach to permitting. This absence of any change to §316(b) to overrule the Agency's long-standing interpretation, despite Congress's amendments to other CWA provisions, "provide[s] further evidence—if more is needed—that Congress intended [EPA's] interpretation, or at least understood [it] as statutorily permissible." *Barnhart v. Walton*, 535 U.S. 212, 220 (2002).

IV. THE SECOND CIRCUIT'S JUDGMENT SHOULD BE REVERSED IN PART

The Second Circuit remanded a number of provisions in the Phase II rule. Pet.App.93a–94a. Some of those provisions, such as the site-specific "cost-cost" and restoration provisions, were remanded for reasons unrelated to the question presented here. The portions of the Second Circuit's judgment remanding the national performance standards and the site-specific cost-benefit provisions, however, should be reversed. They were based on the Second Circuit's erroneous determination that §316(b) bars cost-benefit analysis at the national and local level.

First, the defect the Second Circuit saw in the national performance standards was that "it is impossible to tell whether the EPA based its decision on permissible cost-effectiveness analysis or exceeded its authority by relying impermissibly on a cost-benefit

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F.2d at 311. The First Circuit's treatment was sufficiently definitive that no one challenged EPA's interpretation in federal court again for nearly a quarter century.

analysis." Pet.App.36a. The court of appeals also remanded the national performance standards because they "set performance standards as ranges without requiring facilities to achieve the greatest reduction of adverse impacts they can." Pet.App.94a. In other words, "the Rule does not require facilities to choose technologies that produce the greatest reduction possible." Pet.App.28a. All of those rationales rest on the Second Circuit's erroneous belief that cost-benefit analysis is prohibited, and that the "best technology available" must be the one that reduces impingement and entrainment the most.

Second, the Second Circuit also remanded the section of the rule authorizing site-specific determinations of BTA based on a cost-benefit test, 40 C.F.R. §125.94(a)(5)(ii). As explained above, that holding also rested on the Second Circuit's determination that EPA had impermissibly authorized permitting authorities to weigh the costs and benefits at the local level. Pet.App.57a–60a.

CONCLUSION

The portions of the Second Circuit's judgment remanding EPA's determination of best technology available and related performance standards, as well as the site-specific cost-benefit provisions, should be reversed.

Respectfully submitted,

ELISE E. ZOLI
Counsel of Record
KEVIN P. MARTIN
ROBERT H. FITZGERALD
ALADDINE D. JOROFF
KEVIN P. PECHULIS
GOODWIN PROCTER LLP
53 STATE STREET
BOSTON, MA 02109
(617) 570-1000

ABIGAIL HEMANI
GOODWIN PROCTER LLP
NEW YORK TIMES
BUILDING
620 8TH AVENUE
NEW YORK, NY 10018
(212) 813-8800

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. PEARL STREET
JACKSON, MS 39201
(601) 969-2542
Counsel for Entergy Corp.

MAUREEN E. MAHONEY
Counsel of Record
PHILIP J. PERRY
J. SCOTT BALLENGER
CASSANDRA S. BERNSTEIN
DREW C. ENSIGN
LATHAM & WATKINS LLP
555 11TH STREET, N.W.
SUITE 1000
WASHINGTON, DC 20004
(202) 637-2200

KARL S. LYTZ
LATHAM & WATKINS LLP
505 MONTGOMERY STREET
SUITE 2000
SAN FRANCISCO, CA 94111
(415) 391-0600

JOHN G. VALERI, JR.
PSEG SERVICES CORP.
OFFICE OF ENVIRONMENTAL
COUNSEL
80 PARK PLAZA, T5C
NEWARK, NJ 07102-4194
(973) 430-5506
Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

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ADDENDUM

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§ 1251. Congressional declaration of goals and policy

(a) Restoration and maintenance of chemical, physical and biological integrity of Nation's waters; national goals for achievement of objective

The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter—

(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

(4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

(5) it is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State;

(6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans; and

(7) it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this chapter to be met through the control of both point and nonpoint sources of pollution.

(b) Congressional recognition, preservation, and protection of primary responsibilities and rights of States

It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator in the exercise of his authority under this chapter. It is the policy of Congress that the States manage the construction grant program under this chapter and implement the permit programs under sections 1342 and 1344 of this title. It is further the policy of the Congress to support and aid research relating to the prevention, reduction, and elimination of pollution, and to provide Federal technical services and financial aid to State and interstate agencies and municipalities in connection with the prevention, reduction, and elimination of pollution.

* * *

(d) Administrator of Environmental Protection Agency to administer chapter

Except as otherwise expressly provided in this chapter, the Administrator of the Environmental Protection Agency (hereinafter in this chapter called "Administrator") shall administer this chapter.

* * *

33 U.S.C. § 1311

§ 1311. Effluent limitations

(a) Illegality of pollutant discharges except in compliance with law

Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

(b) Timetable for achievement of objectives

In order to carry out the objective of this chapter there shall be achieved—

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 1314(b) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 1317 of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the

Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 1325 of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of

subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under section 1317 of this title;

(B) Repealed. Pub. L. 97-117, § 21(b), Dec. 29, 1981, 95 Stat. 1632.

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 1317 of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than

publicly owned treatment works, which in the case of pollutants identified pursuant to section 1314(a)(4) of this title shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(4) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of section 1342(a)(1) of this title in a permit issued after February 4, 1987, compliance as expeditiously as practicable but in no case later than three years

after the date such limitations are established, and in no case later than March 31, 1989.

(c) Modification of timetable

The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

(d) Review and revision of effluent limitations

Any effluent limitation required by paragraph (2) of subsection (b) of this section shall be reviewed at least every five years and, if appropriate, revised pursuant to the procedure established under such paragraph.

(e) All point discharge source application of effluent limitations

Effluent limitations established pursuant to this section or section 1312 of this title shall be applied to all point sources of discharge of pollutants in accordance with the provisions of this chapter.

(f) Illegality of discharge of radiological, chemical, or biological warfare agents, high-level radioactive waste, or medical waste

Notwithstanding any other provisions of this chapter it shall be unlawful to discharge any radiological, chemical, or biological warfare agent, any high-level radioactive waste, or any medical waste, into the navigable waters.

(g) Modifications for certain nonconventional pollutants

(1) General authority

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F) of this section) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

(2) Requirements for granting modifications

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that—

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

(3) Limitation on authority to apply for subsection (c) modification

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

(4) Procedures for listing additional pollutants

(A) General authority

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for pollutants identified pursuant to section 1314(a)(4) of this title, toxic

pollutants subject to section 1317(a) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

(B) Requirements for listing

(i) Sufficient information

The person petitioning for listing of an additional pollutant under this subsection shall submit to the Administrator sufficient information to make the determinations required by this subparagraph.

(ii) Toxic criteria determination

The Administrator shall determine whether or not the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title.

(iii) Listing as toxic pollutant

If the Administrator determines that the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title, the Administrator shall list the pollutant as a toxic pollutant under section 1317(a) of this title.

(iv) Nonconventional criteria determination

If the Administrator determines that the pollutant does not meet the criteria for listing as a toxic pollutant under such section and determines that adequate test methods and sufficient data are available to make the

determinations required by paragraph (2) of this subsection with respect to the pollutant, the Administrator shall add the pollutant to the list of pollutants specified in paragraph (1) of this subsection for which modifications are authorized under this subsection.

(C) Requirements for filing of petitions

A petition for listing of a pollutant under this paragraph—

(i) must be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title;

(ii) may be filed before promulgation of such guideline; and

(iii) may be filed with an application for a modification under paragraph (1) with respect to the discharge of such pollutant.

(D) Deadline for approval of petition

A decision to add a pollutant to the list of pollutants for which modifications under this subsection are authorized must be made within 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title.

(E) Burden of proof

The burden of proof for making the determinations under subparagraph (B) shall be on the petitioner.

(5) Removal of pollutants

The Administrator may remove any pollutant from the list of pollutants for which modifications are authorized under this subsection if the Administrator determines that adequate test methods and sufficient data are no longer available for determining whether or not modifications may be granted with respect to such pollutant under paragraph (2) of this subsection.

(h) Modification of secondary treatment requirements

The Administrator, with the concurrence of the State, may issue a permit under section 1342 of this title which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that—

(1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 1314(a)(6) of this title;

(2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water

quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities, in and on the water;

(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of such monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;

(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant will enforce such requirements, and the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no

pretreatment program with respect to such pollutant;

(7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under section 1314(a)(1) of this title after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

For the purposes of this subsection the phrase "the discharge of any pollutant into marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and section 1251(a)(2) of this title. For the purposes of paragraph (9), "primary or equivalent treatment" means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which

applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previously discharged effluent from such treatment works. No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish, fish and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and northward of 40 degrees 10 minutes north latitude.

(i) Municipal time extensions

(1) Where construction is required in order for a planned or existing publicly owned treatment works to achieve limitations under subsection (b)(1)(B) or (b)(1)(C) of this section, but (A) construction cannot be completed within the time required in such subsection, or (B) the United States has failed to make financial assistance under this chapter available in time to achieve such limitations by the time specified in such subsection, the owner or operator of such treatment works may request the Administrator (or if appropriate the State) to issue a permit pursuant to section 1342 of this title or to modify a permit issued pursuant to that section to extend such time for compliance. Any such request shall be filed with the Administrator (or if appropriate the State) within 180 days after February 4, 1987. The Administrator (or if appropriate the State) may grant such request and issue or modify such a permit, which shall contain a schedule of compliance for the publicly owned treatment works based on the earliest date by which such financial assistance will be available from the United States and construction can be completed, but in no event later than July 1, 1988, and shall contain such other terms and conditions, including those necessary to carry out subsections (b) through (g) of section 1281 of this title, section 1317 of this title, and such interim effluent limitations applicable to that treatment works as the Administrator determines are necessary to carry out the provisions of this chapter.

(2)(A) Where a point source (other than a publicly owned treatment works) will not achieve the requirements of subsections (b)(1)(A) and (b)(1)(C) of this section and—

(i) if a permit issued prior to July 1, 1977, to such point source is based upon a discharge into a publicly owned treatment works; or

(ii) if such point source (other than a publicly owned treatment works) had before July 1, 1977, a contract (enforceable against such point source) to discharge into a publicly owned treatment works; or

(iii) if either an application made before July 1, 1977, for a construction grant under this chapter for a publicly owned treatment works, or engineering or architectural plans or working drawings made before July 1, 1977, for a publicly owned treatment works, show that such point source was to discharge into such publicly owned treatment works,

and such publicly owned treatment works is presently unable to accept such discharge without construction, and in the case of a discharge to an existing publicly owned treatment works, such treatment works has an extension pursuant to paragraph (1) of this subsection, the owner or operator of such point source may request the Administrator (or if appropriate the State) to issue or modify such a permit pursuant to such section 1342 of this title to extend such time for compliance. Any such request shall be filed with the Administrator (or if appropriate the State) within 180 days after December 27, 1977, or the filing of a request by the appropriate publicly owned treatment works under paragraph (1) of this subsection, whichever is later. If the Administrator (or if appropriate the State) finds that the owner or operator of such point source has acted in good faith, he may grant such request and issue or modify such

a permit, which shall contain a schedule of compliance for the point source to achieve the requirements of subsections (b)(1)(A) and (C) of this section and shall contain such other terms and conditions, including pretreatment and interim effluent limitations and water conservation requirements applicable to that point source, as the Administrator determines are necessary to carry out the provisions of this chapter.

(B) No time modification granted by the Administrator (or if appropriate the State) pursuant to paragraph (2)(A) of this subsection shall extend beyond the earliest date practicable for compliance or beyond the date of any extension granted to the appropriate publicly owned treatment works pursuant to paragraph (1) of this subsection, but in no event shall it extend beyond July 1, 1988; and no such time modification shall be granted unless (i) the publicly owned treatment works will be in operation and available to the point source before July 1, 1988, and will meet the requirements of subsections (b)(1)(B) and (C) of this section after receiving the discharge from that point source; and (ii) the point source and the publicly owned treatment works have entered into an enforceable contract requiring the point source to discharge into the publicly owned treatment works, the owner or operator of such point source to pay the costs required under section 1284 of this title, and the publicly owned treatment works to accept the discharge from the point source; and (iii) the permit for such point source requires that point source to meet all requirements under section 1317(a) and (b) of this title during the period of such time modification.

(j) Modification procedures

(1) Any application filed under this section for a modification of the provisions of—

(A) subsection (b)(1)(B) of this section under subsection (h) of this section shall be filed not later that [FN1] the 365th day which begins after December 29, 1981, except that a publicly owned treatment works which prior to December 31, 1982, had a contractual arrangement to use a portion of the capacity of an ocean outfall operated by another publicly owned treatment works which has applied for or received modification under subsection (h) of this section, may apply for a modification of subsection (h) of this section in its own right not later than 30 days after February 4, 1987, and except as provided in paragraph (5);

(B) subsection (b)(2)(A) of this section as it applies to pollutants identified in subsection (b)(2)(F) of this section shall be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title or not later than 270 days after December 27, 1977, whichever is later.

(2) Subject to paragraph (3) of this section, any application for a modification filed under subsection (g) of this section shall not operate to stay any requirement under this chapter, unless in the judgment of the Administrator such a stay or the modification sought will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency

in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity, or teratogenicity), or synergistic propensities, and that there is a substantial likelihood that the applicant will succeed on the merits of such application. In the case of an application filed under subsection (g) of this section, the Administrator may condition any stay granted under this paragraph on requiring the filing of a bond or other appropriate security to assure timely compliance with the requirements from which a modification is sought.

(3) Compliance requirements under subsection (g)—

(A) Effect of filing—An application for a modification under subsection (g) of this section and a petition for listing of a pollutant as a pollutant for which modifications are authorized under such subsection shall not stay the requirement that the person seeking such modification or listing comply with effluent limitations under this chapter for all pollutants not the subject of such application or petition.

(B) Effect of disapproval—Disapproval of an application for a modification under subsection (g) of this section shall not stay the requirement that the person seeking such modification comply with all applicable effluent limitations under this chapter.

(4) Deadline for subsection (g) decision—An application for a modification with respect to a pollutant filed under subsection (g) of this section must be approved or disapproved not later than 365 days after the date of such filing; except that in any case in

which a petition for listing such pollutant as a pollutant for which modifications are authorized under such subsection is approved, such application must be approved or disapproved not later than 365 days after the date of approval of such petition.

(5) Extension of application deadline—

(A) In general—In the 180-day period beginning on October 31, 1994, the city of San Diego, California, may apply for a modification pursuant to subsection (h) of this section of the requirements of subsection (b)(1)(B) of this section with respect to biological oxygen demand and total suspended solids in the effluent discharged into marine waters.

(B) Application—An application under this paragraph shall include a commitment by the applicant to implement a waste water reclamation program that, at a minimum, will—

(i) achieve a system capacity of 45,000,000 gallons of reclaimed waste water per day by January 1, 2010; and

(ii) result in a reduction in the quantity of suspended solids discharged by the applicant into the marine environment during the period of the modification.

(C) Additional conditions—The Administrator may not grant a modification pursuant to an application submitted under this paragraph unless the Administrator determines that such modification will result in removal of not less than 58 percent of the biological oxygen demand (on an annual average)

and not less than 80 percent of total suspended solids (on a monthly average) in the discharge to which the application applies.

(D) Preliminary decision deadline—The Administrator shall announce a preliminary decision on an application submitted under this paragraph not later than 1 year after the date the application is submitted.

(k) Innovative technology

In the case of any facility subject to a permit under section 1342 of this title which proposes to comply with the requirements of subsection (b)(2)(A) or (b)(2)(E) of this section by replacing existing production capacity with an innovative production process which will result in an effluent reduction significantly greater than that required by the limitation otherwise applicable to such facility and moves toward the national goal of eliminating the discharge of all pollutants, or with the installation of an innovative control technique that has a substantial likelihood for enabling the facility to comply with the applicable effluent limitation by achieving a significantly greater effluent reduction than that required by the applicable effluent limitation and moves toward the national goal of eliminating the discharge of all pollutants, or by achieving the required reduction with an innovative system that has the potential for significantly lower costs than the systems which have been determined by the Administrator to be economically achievable, the Administrator (or the State with an approved program under section 1342 of this title, in consultation with the Administrator) may establish a date for compliance under subsection (b)(2)(A) or (b)(2)(E) of this section no later than two

years after the date for compliance with such effluent limitation which would otherwise be applicable under such subsection, if it is also determined that such innovative system has the potential for industrywide application.

(*l*) Toxic pollutants

Other than as provided in subsection (n) of this section, the Administrator may not modify any requirement of this section as it applies to any specific pollutant which is on the toxic pollutant list under section 1317(a)(1) of this title.

(m) Modification of effluent limitation requirements for point sources

(1) The Administrator, with the concurrence of the State, may issue a permit under section 1342 of this title which modifies the requirements of subsections (b)(1)(A) and (b)(2)(E) of this section, and of section 1343 of this title, with respect to effluent limitations to the extent such limitations relate to biochemical oxygen demand and pH from discharges by an industrial discharger in such State into deep waters of the territorial seas, if the applicant demonstrates and the Administrator finds that—

(A) the facility for which modification is sought is covered at the time of the enactment of this subsection by National Pollutant Discharge Elimination System permit number CA0005894 or CA0005282;

(B) the energy and environmental costs of meeting such requirements of subsections (b)(1)(A)

and (b)(2)(E) of this section and section 1343 of this title exceed by an unreasonable amount the benefits to be obtained, including the objectives of this chapter;

(C) the applicant has established a system for monitoring the impact of such discharges on a representative sample of aquatic biota;

(D) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(E) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(F) the discharge is into waters where there is strong tidal movement and other hydrological and geological characteristics which are necessary to allow compliance with this subsection and section 1251(a)(2) of this title;

(G) the applicant accepts as a condition to the permit a contractural [FN2] obligation to use funds in the amount required (but not less than $250,000 per year for ten years) for research and development of water pollution control technology, including but not limited to closed cycle technology;

(H) the facts and circumstances present a unique situation which, if relief is granted, will not establish a precedent or the relaxation of the requirements of this chapter applicable to similarly situated discharges; and

(I) no owner or operator of a facility comparable to that of the applicant situated in the United States has demonstrated that it would be put at a competitive disadvantage to the applicant (or the parent company or any subsidiary thereof) as a result of the issuance of a permit under this subsection.

(2) The effluent limitations established under a permit issued under paragraph (1) shall be sufficient to implement the applicable State water quality standards, to assure the protection of public water supplies and protection and propagation of a balanced, indigenous population of shellfish, fish, fauna, wildlife, and other aquatic organisms, and to allow recreational activities in and on the water. In setting such limitations, the Administrator shall take into account any seasonal variations and the need for an adequate margin of safety, considering the lack of essential knowledge concerning the relationship between effluent limitations and water quality and the lack of essential knowledge of the effects of discharges on beneficial uses of the receiving waters.

(3) A permit under this subsection may be issued for a period not to exceed five years, and such a permit may be renewed for one additional period not to exceed five years upon a demonstration by the applicant and a finding by the Administrator at the time of application for any such renewal that the provisions of this subsection are met.

(4) The Administrator may terminate a permit issued under this subsection if the Administrator determines that there has been a decline in ambient

water quality of the receiving waters during the period of the permit even if a direct cause and effect relationship cannot be shown: Provided, That if the effluent from a source with a permit issued under this subsection is contributing to a decline in ambient water quality of the receiving waters, the Administrator shall terminate such permit.

(n) Fundamentally different factors

(1) General rule

The Administrator, with the concurrence of the State, may establish an alternative requirement under subsection (b)(2) of this section or section 1317(b) of this title for a facility that modifies the requirements of national effluent limitation guidelines or categorical pretreatment standards that would otherwise be applicable to such facility, if the owner or operator of such facility demonstrates to the satisfaction of the Administrator that—

(A) the facility is fundamentally different with respect to the factors (other than cost) specified in section 1314(b) or 1314(g) of this title and considered by the Administrator in establishing such national effluent limitation guidelines or categorical pretreatment standards;

(B) the application—

(i) is based solely on information and supporting data submitted to the Administrator during the rulemaking for establishment of the applicable national

effluent limitation guidelines or categorical pretreatment standard specifically raising the factors that are fundamentally different for such facility; or

(ii) is based on information and supporting data referred to in clause (i) and information and supporting data the applicant did not have a reasonable opportunity to submit during such rulemaking;

(C) the alternative requirement is no less stringent than justified by the fundamental difference; and

(D) the alternative requirement will not result in a non-water quality environmental impact which is markedly more adverse than the impact considered by the Administrator in establishing such national effluent limitation guideline or categorical pretreatment standard.

(2) Time limit for applications

An application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this subsection must be submitted to the Administrator within 180 days after the date on which such limitation or standard is established or revised, as the case may be.

(3) Time limit for decision

The Administrator shall approve or deny by final agency action an application submitted under this

subsection within 180 days after the date such application is filed with the Administrator.

(4) Submission of information

The Administrator may allow an applicant under this subsection to submit information and supporting data until the earlier of the date the application is approved or denied or the last day that the Administrator has to approve or deny such application.

(5) Treatment of pending applications

For the purposes of this subsection, an application for an alternative requirement based on fundamentally different factors which is pending on February 4, 1987, shall be treated as having been submitted to the Administrator on the 180th day following February 4, 1987. The applicant may amend the application to take into account the provisions of this subsection.

(6) Effect of submission of application

An application for an alternative requirement under this subsection shall not stay the applicant's obligation to comply with the effluent limitation guideline or categorical pretreatment standard which is the subject of the application.

(7) Effect of denial

If an application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this

subsection is denied by the Administrator, the applicant must comply with such limitation or standard as established or revised, as the case may be.

(8) Reports

By January 1, 1997, and January 1 of every odd-numbered year thereafter, the Administrator shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report on the status of applications for alternative requirements which modify the requirements of effluent limitations under section 1311 or 1314 of this title or any national categorical pretreatment standard under section 1317(b) of this title filed before, on, or after February 4, 1987.

(o) Application fees

The Administrator shall prescribe and collect from each applicant fees reflecting the reasonable administrative costs incurred in reviewing and processing applications for modifications submitted to the Administrator pursuant to subsections (c), (g), (i), (k), (m), and (n) of this section, section 1314(d)(4) of this title, and section 1326(a) of this title. All amounts collected by the Administrator under this subsection shall be deposited into a special fund of the Treasury entitled "Water Permits and Related Services" which shall thereafter be available for appropriation to carry out activities of the Environmental Protection Agency for which such fees were collected.

(p) Modified permit for coal remining operations

(1) In general

Subject to paragraphs (2) through (4) of this subsection, the Administrator, or the State in any case which the State has an approved permit program under section 1342(b) of this title, may issue a permit under section 1342 of this title which modifies the requirements of subsection (b)(2)(A) of this section with respect to the pH level of any pre-existing discharge, and with respect to pre-existing discharges of iron and manganese from the remined area of any coal remining operation or with respect to the pH level or level of iron or manganese in any pre-existing discharge affected by the remining operation. Such modified requirements shall apply the best available technology economically achievable on a case-by-case basis, using best professional judgment, to set specific numerical effluent limitations in each permit.

(2) Limitations

The Administrator or the State may only issue a permit pursuant to paragraph (1) if the applicant demonstrates to the satisfaction of the Administrator or the State, as the case may be, that the coal remining operation will result in the potential for improved water quality from the remining operation but in no event shall such a permit allow the pH level of any discharge, and in no event shall such a permit allow the discharges of iron and manganese, to exceed the levels being discharged from the remined area before the coal remining operation begins. No discharge from, or

affected by, the remining operation shall exceed State water quality standards established under section 1313 of this title.

(3) Definitions

For purposes of this subsection—

(A) Coal remining operation

The term "coal remining operation" means a coal mining operation which begins after February 4, 1987 at a site on which coal mining was conducted before August 3, 1977.

(B) Remined area

The term "remined area" means only that area of any coal remining operation on which coal mining was conducted before August 3, 1977.

(C) Pre-existing discharge

The term "pre-existing discharge" means any discharge at the time of permit application under this subsection.

(4) Applicability of strip mining laws

Nothing in this subsection shall affect the application of the Surface Mining Control and Reclamation Act of 1977 [30 U.S.C.A. § 1201 et seq.] to any coal remining operation, including the application of such Act to suspended solids.

[FN1] So in original. Probably should be "than".

[FN2] So in original. Probably should be "contractual".

33 U.S.C. § 1314

§ 1314. Information and guidelines

(a) Criteria development and publication

(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all navigable waters, ground waters, waters of the contiguous zone, and the oceans; (B) on the factors necessary for the protection and propagation of shellfish, fish, and

wildlife for classes and categories of receiving waters and to allow recreational activities in and on the water; and (C) on the measurement and classification of water quality; and (D) for the purpose of section 1313 of this title, on and the identification of pollutants suitable for maximum daily load measurement correlated with the achievement of water quality objectives.

(3) Such criteria and information and revisions thereof shall be issued to the States and shall be published in the Federal Register and otherwise made available to the public.

(4) The Administrator shall, within 90 days after December 27, 1977, and from time to time thereafter, publish and revise as appropriate information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH. The thermal component of any discharge shall not be identified as a conventional pollutant under this paragraph.

(5)(A) The Administrator, to the extent practicable before consideration of any request under section 1311(g) of this title and within six months after December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(B) The Administrator, to the extent practicable before consideration of any application under section 1311(h) of this title and within six months after

December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(6) The Administrator shall, within three months after December 27, 1977, and annually thereafter, for purposes of section 1311(h) of this title publish and revise as appropriate information identifying each water quality standard in effect under this chapter or State law, the specific pollutants associated with such water quality standard, and the particular waters to which such water quality standard applies.

(7) Guidance to states—The Administrator, after consultation with appropriate State agencies and on the basis of criteria and information published under paragraphs (1) and (2) of this subsection, shall develop and publish, within 9 months after February 4, 1987, guidance to the States on performing the identification required by subsection (l)(1) of this section.

(8) Information on water quality criteria—The Administrator, after consultation with appropriate State agencies and within 2 years after February 4, 1987, shall develop and publish information on methods for establishing and measuring water quality criteria for toxic pollutants on other bases than pollutant by-pollutant criteria, including biological monitoring and assessment methods.

(9) Revised criteria for coastal recreation waters—

(A) In general—Not later than 5 years after October 10, 2000, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 1254(v) of this title, for the purpose of protecting human health in coastal recreation waters.

(B) Reviews—Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter, the Administrator shall review and, as necessary, revise the water quality criteria.

(b) Effluent limitation guidelines

For the purpose of adopting or revising effluent limitations under this chapter the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of October 18, 1972, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. Such regulations shall—

(1)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best practicable control technology currently

available for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the control measures and practices to be applicable to point sources (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best practicable control technology currently available to comply with subsection (b)(1) of section 1311 of this title shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(2)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best measures and practices available to comply with subsection (b)(2) of section

1311 of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(3) identify control measures and practices available to eliminate the discharge of pollutants from categories and classes of point sources, taking into account the cost of achieving such elimination of the discharge of pollutants; and

(4)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best conventional pollutant control technology (including measures and practices) for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best conventional pollutant control technology measures and practices to comply with section 1311(b)(2)(E) of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best conventional pollutant control technology (including

measures and practices) shall include consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, and shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.

(c) Pollution discharge elimination procedures

The Administrator, after consultation, with appropriate Federal and State agencies and other interested persons, shall issue to the States and appropriate water pollution control agencies within 270 days after October 18, 1972 (and from time to time thereafter) information on the processes, procedures, or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under section 1316 of this title. Such information shall include technical and other data, including costs, as are available on alternative methods of elimination or reduction of the discharge of pollutants. Such information, and revisions thereof, shall be published in the Federal Register and otherwise shall be made available to the public.

(d) Secondary treatment information; alternative waste treatment management techniques; innovative and alternative wastewater treatment processes; facilities deemed equivalent of secondary treatment

(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall publish within sixty days after October 18, 1972 (and from time to time thereafter) information, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, on the degree of effluent reduction attainable through the application of secondary treatment.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall publish within nine months after October 18, 1972 (and from time to time thereafter) information on alternative waste treatment management techniques and systems available to implement section 1281 of this title.

(3) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall promulgate within one hundred and eighty days after December 27, 1977, guidelines for identifying and evaluating innovative and alternative wastewater treatment processes and techniques referred to in section 1281(g)(5) of this title.

(4) For the purposes of this subsection, such biological treatment facilities as oxidation ponds, lagoons, and ditches and trickling filters shall be deemed the equivalent of secondary treatment. The

Administrator shall provide guidance under paragraph (1) of this subsection on design criteria for such facilities, taking into account pollutant removal efficiencies and, consistent with the objectives of this chapter, assuring that water quality will not be adversely affected by deeming such facilities as the equivalent of secondary treatment.

(e) Best management practices for industry

The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, may publish regulations, supplemental to any effluent limitations specified under subsections (b) and (c) of this section for a class or category of point sources, for any specific pollutant which the Administrator is charged with a duty to regulate as a toxic or hazardous pollutant under section 1317(a)(1) or 1321 of this title, to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage which the Administrator determines are associated with or ancillary to the industrial manufacturing or treatment process within such class or category of point sources and may contribute significant amounts of such pollutants to navigable waters. Any applicable controls established under this subsection shall be included as a requirement for the purposes of section 1311, 1312, 1316, 1317, or 1343 of this title, as the case may be, in any permit issued to a point source pursuant to section 1342 of this title.

(f) Identification and evaluation of nonpoint sources of pollution; processes, procedures, and methods to control pollution

The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall issue to appropriate Federal agencies, the States, water pollution control agencies, and agencies designated under section 1288 of this title, within one year after October 18, 1972 (and from time to time thereafter) information including (1) guidelines for identifying and evaluating the nature and extent of nonpoint sources of pollutants, and (2) processes, procedures, and methods to control pollution resulting from—

(A) agricultural and silvicultural activities, including runoff from fields and crop and forest lands;

(B) mining activities, including runoff and siltation from new, currently operating, and abandoned surface and underground mines;

(C) all construction activity, including runoff from the facilities resulting from such construction;

(D) the disposal of pollutants in wells or in subsurface excavations;

(E) salt water intrusion resulting from reductions of fresh water flow from any cause, including extraction of ground water, irrigation, obstruction, and diversion; and

(F) changes in the movement, flow, or circulation of any navigable waters or ground waters, including changes caused by the construction of dams, levees, channels, causeways, or flow diversion facilities.

Such information and revisions thereof shall be published in the Federal Register and otherwise made available to the public.

(g) Guidelines for pretreatment of pollutants

(1) For the purpose of assisting States in carrying out programs under section 1342 of this title, the Administrator shall publish, within one hundred and twenty days after October 18, 1972, and review at least annually thereafter and, if appropriate, revise guidelines for pretreatment of pollutants which he determines are not susceptible to treatment by publicly owned treatment works. Guidelines under this subsection shall be established to control and prevent the discharge into the navigable waters, the contiguous zone, or the ocean (either directly or through publicly owned treatment works) of any pollutant which interferes with, passes through, or otherwise is incompatible with such works.

(2) When publishing guidelines under this subsection, the Administrator shall designate the category or categories of treatment works to which the guidelines shall apply.

(h) Test procedures guidelines

The Administrator shall, within one hundred and eighty days from October 18, 1972, promulgate guidelines establishing test procedures for the analysis of pollutants that shall include the factors which must be provided in any certification pursuant to section 1341 of this title or permit application pursuant to section 1342 of this title.

(i) Guidelines for monitoring, reporting, enforcement, funding, personnel, and manpower

The Administrator shall (1) within sixty days after October 18, 1972, promulgate guidelines for the purpose of establishing uniform application forms and other minimum requirements for the acquisition of information from owners and operators of point-sources of discharge subject to any State program under section 1342 of this title, and (2) within sixty days from October 18, 1972, promulgate guidelines establishing the minimum procedural and other elements of any State program under section 1342 of this title, which shall include:

(A) monitoring requirements;

(B) reporting requirements (including procedures to make information available to the public);

(C) enforcement provisions; and

(D) funding, personnel qualifications, and manpower requirements (including a requirement that no board or body which approves permit applications or portions thereof shall include, as a member, any person who receives, or has during the previous two years received, a significant portion of his income directly or indirectly from permit holders or applicants for a permit).

(j) Lake restoration guidance manual

The Administrator shall, within 1 year after February 4, 1987, and biennially thereafter, publish and disseminate a lake restoration guidance manual

describing methods, procedures, and processes to guide State and local efforts to improve, restore, and enhance water quality in the Nation's publicly owned lakes.

(k) Agreements with Secretaries of Agriculture, Army, and the Interior to provide maximum utilization of programs to achieve and maintain water quality; transfer of funds; authorization of appropriations

(1) The Administrator shall enter into agreements with the Secretary of Agriculture, the Secretary of the Army, and the Secretary of the Interior, and the heads of such other departments, agencies, and instrumentalities of the United States as the Administrator determines, to provide for the maximum utilization of other Federal laws and programs for the purpose of achieving and maintaining water quality through appropriate implementation of plans approved under section 1288 of this title and nonpoint source pollution management programs approved under section 1329 of this title.

(2) The Administrator is authorized to transfer to the Secretary of Agriculture, the Secretary of the Army, and the Secretary of the Interior and the heads of such other departments, agencies, and instrumentalities of the United States as the Administrator determines, any funds appropriated under paragraph (3) of this subsection to supplement funds otherwise appropriated to programs authorized pursuant to any agreement under paragraph (1).

(3) There is authorized to be appropriated to carry out the provisions of this subsection, $100,000,000 per fiscal year for the fiscal years 1979 through 1983 and

such sums as may be necessary for fiscal years 1984 through 1990.

(*l*) Individual control strategies for toxic pollutants

(1) State list of navigable waters and development of strategies

Not later than 2 years after February 4, 1987, each State shall submit to the Administrator for review, approval, and implementation under this subsection—

(A) a list of those waters within the State which after the application of effluent limitations required under section 1311(b)(2) of this title cannot reasonably be anticipated to attain or maintain (i) water quality standards for such waters reviewed, revised, or adopted in accordance with section 1313(c)(2)(B) of this title, due to toxic pollutants, or (ii) that water quality which shall assure protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water;

(B) a list of all navigable waters in such State for which the State does not expect the applicable standard under section 1313 of this title will be achieved after the requirements of sections 1311(b), 1316, and 1317(b) of this title are met, due entirely or substantially to discharges from point sources of any toxic pollutants listed pursuant to section 1317(a) of this title;

(C) for each segment of the navigable waters included on such lists, a determination of the specific point sources discharging any such toxic pollutant which is believed to be preventing or impairing such water quality and the amount of each such toxic pollutant discharged by each such source; and

(D) for each such segment, an individual control strategy which the State determines will produce a reduction in the discharge of toxic pollutants from point sources identified by the State under this paragraph through the establishment of effluent limitations under section 1342 of this title and water quality standards under section 1313(c)(2)(B) of this title, which reduction is sufficient, in combination with existing controls on point and nonpoint sources of pollution, to achieve the applicable water quality standard as soon as possible, but not later than 3 years after the date of the establishment of such strategy.

(2) Approval or disapproval

Not later than 120 days after the last day of the 2-year period referred to in paragraph (1), the Administrator shall approve or disapprove the control strategies submitted under paragraph (1) by any State.

(3) Administrator's action

If a State fails to submit control strategies in accordance with paragraph (1) or the Administrator does not approve the control strategies submitted by such State in accordance with paragraph (1),

then, not later than 1 year after the last day of the period referred to in paragraph (2), the Administrator, in cooperation with such State and after notice and opportunity for public comment, shall implement the requirements of paragraph (1) in such State. In the implementation of such requirements, the Administrator shall, at a minimum, consider for listing under this subsection any navigable waters for which any person submits a petition to the Administrator for listing not later than 120 days after such last day.

(m) Schedule for review of Guidelines

(1) Publication

Within 12 months after February 4, 1987, and biennially thereafter, the Administrator shall publish in the Federal Register a plan which shall—

(A) establish a schedule for the annual review and revision of promulgated effluent guidelines, in accordance with subsection (b) of this section;

(B) identify categories of sources discharging toxic or nonconventional pollutants for which guidelines under subsection (b)(2) of this section and section 1316 of this title have not previously been published; and

(C) establish a schedule for promulgation of effluent guidelines for categories identified in subparagraph (B), under which promulgation of such guidelines shall be no later than 4 years after February 4, 1987, for categories identified in the first published plan or 3 years after the

publication of the plan for categories identified in later published plans.

(2) Public review

The Administrator shall provide for public review and comment on the plan prior to final publication.

33 U.S.C. § 1316

§ 1316. National standards of performance

(a) Definitions

For purposes of this section:

(1) The term "standard of performance" means a standard for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

(2) The term "new source" means any source, the construction of which is commenced after the publication of proposed regulations prescribing a standard of performance under this section which will be applicable to such source, if such standard is thereafter promulgated in accordance with this section.

(3) The term "source" means any building, structure, facility, or installation from which there is or may be the discharge of pollutants.

(4) The term "owner or operator" means any person who owns, leases, operates, controls, or supervises a source.

(5) The term "construction" means any placement, assembly, or installation of facilities or equipment (including contractual obligations to purchase such facilities or equipment) at the premises where such

equipment will be used, including preparation work at such premises.

(b) Categories of sources; Federal standards of performance for new sources

(1)(A) The Administrator shall, within ninety days after October 18, 1972, publish (and from time to time thereafter shall revise) a list of categories of sources, which shall, at the minimum, include:

pulp and paper mills;

paperboard, builders paper and board mills;

meat product and rendering processing;

dairy product processing;

grain mills;

canned and preserved fruits and vegetables processing;

canned and preserved seafood processing;

sugar processing;

textile mills;

cement manufacturing;

feedlots;

electroplating;

organic chemicals manufacturing;

inorganic chemicals manufacturing;

plastic and synthetic materials manufacturing;

soap and detergent manufacturing;

fertilizer manufacturing;

petroleum refining;

iron and steel manufacturing;

nonferrous metals manufacturing;

phosphate manufacturing;

steam electric powerplants;

ferroalloy manufacturing;

leather tanning and finishing;

glass and asbestos manufacturing;

rubber processing; and

timber products processing.

(B) As soon as practicable, but in no case more than one year, after a category of sources is included in a list under subparagraph (A) of this paragraph, the Administrator shall propose and publish regulations establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one hundred and twenty days after publication of such proposed regulations, such standards with such adjustments as he deems appropriate. The Administrator shall, from time to time, as technology and alternatives change, revise such standards following the procedure required by this subsection for promulgation of such standards. Standards of performance, or revisions thereof, shall become effective upon promulgation. In establishing or revising Federal standards of performance for new sources under this section, the Administrator shall take into consideration the cost of achieving such effluent

reduction, and any non-water quality, environmental impact and energy requirements.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards and shall consider the type of process employed (including whether batch or continuous).

(3) The provisions of this section shall apply to any new source owned or operated by the United States.

(c) State enforcement of standards of performance

Each State may develop and submit to the Administrator a procedure under State law for applying and enforcing standards of performance for new sources located in such State. If the Administrator finds that the procedure and the law of any State require the application and enforcement of standards of performance to at least the same extent as required by this section, such State is authorized to apply and enforce such standards of performance (except with respect to new sources owned or operated by the United States).

(d) Protection from more stringent standards

Notwithstanding any other provision of this chapter, any point source the construction of which is commenced after October 18, 1972, and which is so constructed as to meet all applicable standards of performance shall not be subject to any more stringent standard of performance during a ten-year period beginning on the date of completion of such construction or during the period of depreciation or

amortization of such facility for the purposes of section 167 or 169 (or both) of Title 26, whichever period ends first.

(e) Illegality of operation of new sources in violation of applicable standards of performance

After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

33 U.S.C. § 1326

§ 1326. Thermal discharges

(a) Effluent limitations that will assure protection and propagation of balanced, indigenous population of shellfish, fish, and wildlife

With respect to any point source otherwise subject to the provisions of section 1311 of this title or section 1316 of this title, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such sections for such plant, with respect to the thermal component of such discharge (taking into account the interaction of such thermal component with other pollutants), that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.

(b) Cooling water intake structures

Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

(c) Period of protection from more stringent effluent limitations following discharge point source modification commenced after October 18, 1972

Notwithstanding any other provision of this chapter, any point source of a discharge having a thermal component, the modification of which point source is commenced after October 18, 1972, and which, as modified, meets effluent limitations established under section 1311 of this title or, if more stringent, effluent limitations established under section 1313 of this title and which effluent limitations will assure protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in or on the water into which the discharge is made, shall not be subject to any more stringent effluent limitation with respect to the thermal component of its discharge during a ten year period beginning on the date of completion of such modification or during the period of depreciation or amortization of such facility for the purpose of section 167 or 169 (or both) of title 26, whichever period ends first.

33 U.S.C. § 1342

§ 1342. National pollutant discharge elimination system

(a) Permits for discharge of pollutants

(1) Except as provided in sections 1328 and 1344 of this title, the Administrator may, after opportunity for public hearing, issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a) of this title, upon condition that such discharge will meet either (A) all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or (B) prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.

(2) The Administrator shall prescribe conditions for such permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate.

(3) The permit program of the Administrator under paragraph (1) of this subsection, and permits issued thereunder, shall be subject to the same terms, conditions, and requirements as apply to a State permit program and permits issued thereunder under subsection (b) of this section.

(4) All permits for discharges into the navigable waters issued pursuant to section 407 of this title shall

be deemed to be permits issued under this subchapter, and permits issued under this subchapter shall be deemed to be permits issued under section 407 of this title, and shall continue in force and effect for their term unless revoked, modified, or suspended in accordance with the provisions of this chapter.

(5) No permit for a discharge into the navigable waters shall be issued under section 407 of this title after October 18, 1972. Each application for a permit under section 407 of this title, pending on October 18, 1972, shall be deemed to be an application for a permit under this section. The Administrator shall authorize a State, which he determines has the capability of administering a permit program which will carry out the objective of this chapter to issue permits for discharges into the navigable waters within the jurisdiction of such State. The Administrator may exercise the authority granted him by the preceding sentence only during the period which begins on October 18, 1972, and ends either on the ninetieth day after the date of the first promulgation of guidelines required by section 1314(i)(2) of this title, or the date of approval by the Administrator of a permit program for such State under subsection (b) of this section, whichever date first occurs, and no such authorization to a State shall extend beyond the last day of such period. Each such permit shall be subject to such conditions as the Administrator determines are necessary to carry out the provisions of this chapter. No such permit shall issue if the Administrator objects to such issuance.

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PETITIONER'S BRIEF

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In the
Supreme Court of the United States

**ENTERGY CORP.,
PSEG LLC AND PSEG NUCLEAR LLC, AND
UTILITY WATER ACT GROUP,**

Petitioners,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

***ON WRITS OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT***

BRIEF OF PETITIONER UTILITY WATER ACT GROUP

KRISTY A. N. BULLEIT
Counsel of Record
HUNTON & WILLIAMS LLP
1900 K STREET, N.W.
WASHINGTON, DC 20006-1109
(202) 955-1547

Counsel for Petitioner

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QUESTION PRESENTED FOR REVIEW

Whether Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency ("EPA") to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

PARTIES TO THE PROCEEDING

The Utility Water Act Group ("UWAG") is a petitioner in this Court and was a petitioner in the court of appeals.

PSEG Fossil LLC, PSEG Nuclear LLC, and Entergy Corporation are petitioners in this Court and were petitioners in the court of appeals. Appalachian Power Company and the Illinois Energy Association, which participated below, are *not* parties to this appeal.

The United States Environmental Protection Agency is a respondent in this Court and was a respondent in the court of appeals.

The following parties are respondents in this Court and were petitioners in the court of appeals: Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay-People for Narragansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network,

Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, Surfrider Foundation, State of Connecticut, State of Delaware, Commonwealth of Massachusetts, State of New Jersey, State of New York, and Commonwealth of Rhode Island.

The industry parties, environmental groups, and States jointly petitioned to intervene in the other petitioners' cases in the court of appeals on August 27, 2004.

Pursuant to Rules 24.1 and 29.6, there is no change to the disclosure statement previously filed by the Utility Water Act Group.

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OPINION BELOW

The opinion of the U.S. Court of Appeals for the Second Circuit (Pet. App. 1a-94a)[1] is reported at *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007) ("*Riverkeeper II*").

JURISDICTION

The Second Circuit entered judgment on January 25, 2007, and denied petitions for rehearing and rehearing *en banc* on July 5, 2007. Timely petitions for certiorari were filed on November 2, 2007 following an extension of time. Certiorari was granted April 14, 2008, *PSEG Fossil LLC v. Riverkeeper, Inc.*, 128 S. Ct. 1867, 1868 (2008). The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

STATUTORY AND REGULATORY PROVISIONS INVOLVED

This case concerns § 316(b) of the Federal Water Pollution Control Act, commonly known as the Clean Water Act ("CWA" or the "Act"), 33 U.S.C. § 1326(b). Section 316(b) states:

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[1] Citations to "Pet. App." refer to the Appendix to the Petition for Certiorari filed by Entergy Corp. in No. 07-588. "J.A." refers to the Joint Appendix. There is also a "UWAG Appendix" attached to this brief.

> Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

This provision, as well as parts of CWA §§ 301, 304, and 306, 33 U.S.C. §§ 1311, 1314, 1316, are reproduced in the addendum to this brief and at Pet. App. 97a-113a. The rule at issue here (*National Pollutant Discharge Elimination System – Final Regulation to Establish Requirements for Intake Structures at Phase II Facilities*, 69 Fed. Reg. 41,575-693 (July 9, 2004) ("Phase II" rule)) was codified at 40 C.F.R. Part 125, Subpart J, and is reproduced at Pet. App. 122a-593a.

STATEMENT OF THE CASE

This case concerns the regulations for existing power plant cooling water intake structures ("intake structures" or simply "intakes") that EPA adopted under § 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b). More specifically, this case focuses on whether EPA may use cost-benefit analysis to develop national intake structure standards for existing power plants and allow permit writers to use cost-benefit analysis on a site-specific basis in selecting the "best technology available" ("BTA") for

"minimizing" "adverse environmental impact" as required by § 316(b).

For the past 30 years, EPA has implemented § 316(b) case-by-case, taking into account costs and benefits in deciding which intake technology is the best for minimizing adverse environmental impact at a particular site. In developing the rule at issue here, EPA's deliberations were informed by this history, and by its understanding of the biological and technological complexities involved in § 316(b) implementation, especially at existing facilities. After nine years of deliberation, it developed the "Phase II" rule, which attempts to streamline the BTA selection process by setting national standards based on the estimated performance of a suite of commercially available intake structure technologies. The rule requires hundreds of existing steam electric power plants to use one or more of those technologies to achieve national standards for reducing the degree to which aquatic organisms are trapped against ("impinged" by) or drawn through ("entrained" by) cooling water intake structures.

EPA selected this approach after carefully considering many alternatives, including requiring some or all existing Phase II facilities that have once-through or "open-cycle" cooling systems to replace them with recirculating systems. Recirculating or "closed-cycle" facilities reduce the amount of water withdrawn, but only at a substantial cost both in environmental and economic terms. EPA looked at those environmental and economic costs, compared them to the additional

reduction in impingement and entrainment that closed-cycle cooling might achieve, and concluded that requiring closed-cycle cooling was not BTA.

EPA recognized, however, that determining what is necessary to minimize adverse environmental impacts can necessitate a site-specific inquiry of the type it had previously required for all facilities. Therefore, the rule also includes a provision authorizing alternative standards for a particular site where the facility can demonstrate that the overall costs of achieving the national standards are substantially greater than the overall benefits.

The Second Circuit rejected this reasonable approach, concluding that EPA is not permitted to weigh costs and benefits in implementing § 316(b). For the reasons given in the separate brief filed by Entergy Corp., PSEG Nuclear, and PSEG Fossil in the consolidated cases 07-588 and 07-589 ("Entergy/PSEG Brief"), EPA's conclusion that § 316(b) permits some comparison of marginal environmental benefits with the costs of achieving them, both at the national level and at particular sites, is the only reasonable reading of the Act and thus should have been upheld under "step one" of the analysis required by *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837 (1984). In addition, as explained in the Entergy/PSEG Brief and more fully herein, the Act is at least ambiguous as to whether EPA may compare costs and benefits under § 316(b). EPA's reading of the Act to permit such comparisons, both nationally and at particular sites, is wholly reasonable and thus

should have been upheld under "step two" of the *Chevron* analysis. In either case the decision below is wrong and must be reversed.

I. Background

A. Cooling Water Intake Structures

EPA has always understood that regulating intake structures involves myriad complex, site-specific environmental, energy, and economic trade-offs that can appropriately be evaluated by using cost-benefit analysis. For example, the Agency has long understood that the "environmental impact" of an intake structure depends partly, but only partly, on the type of cooling system it serves.

Steam electric power plants come in different sizes and configurations, but they all operate on the same principle: water is boiled to make steam, which drives a turbine, which powers an electric generator. All steam electric plants need a way to condense the steam back to water. Most use cooling water for that purpose.[2]

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[2] A few employ "dry cooling," which uses natural or mechanical air drafts to remove heat and requires little or no water. Pet. App. 270a (69 Fed. Reg. 41,608). Even for new facilities, where it would be easiest and cheapest to install dry cooling systems, EPA did not require them, because they are costly, reduce water intake only minimally compared to closed-cycle wet cooling, increase air pollution and energy penalties, and have other disadvantages. In ruling on challenges to EPA's earlier "Phase I" rule for new facilities (66 Fed. Reg. 65,256

(continued...)

The amount of cooling water withdrawn from a waterbody by a steam electric plant depends on a variety of factors, one of which is the type of condenser cooling system. There are two basic types of "wet" condenser cooling systems: open-cycle and closed-cycle. Open-cycle systems pass water through the condenser only once before returning virtually all the water to its source, albeit at a higher temperature. Closed-cycle systems recirculate the heated water from the condenser through an evaporative cooling structure (typically a cooling tower, pond, or lake) two or more times before the build-up of salts in the water requires the system to "blow down" (*i.e.*, discharge). Closed-cycle systems withdraw from 70% to 98% less water than open-cycle systems, depending on the water's salinity level, Pet. App. 240a (69 Fed. Reg. 41,601 n.44), but they evaporate (*i.e.*, consume) most of the water withdrawn, returning very little to its source.

EPA also understood that the amount of water withdrawn does not alone determine the "environmental impact" that a cooling water intake structure will have, even if impact is gauged solely by intake-induced impingement and entrainment mortality. Local characteristics of the waterbody

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(Dec. 18, 2001)), the Second Circuit upheld EPA's decision. *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 182 n.5 (2d Cir. 2004) (*"Riverkeeper I"*). For *existing* facilities, no party to this case has disputed EPA's determination that dry cooling is not BTA.

and its fish are just as important, as are the characteristics of the intake structure.[3]

In formulating the Phase II rule, EPA identified 20 distinct ecosystem and species characteristics and 18 intake features that influence impingement and entrainment losses.[4] These factors interact to determine the numbers and types of healthy organisms near the intake at any given time; the likelihood those organisms will survive an encounter with the intake; and the consequences of any losses that occur. Which factors are most important varies by site.

Indeed, EPA's record demonstrates that the types and numbers of organisms impinged and entrained over time and among different sites could vary tremendously – for some species, by factors in excess of *40,000*.[5]

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[3] *See, e.g.*, Pet. App. 216a, 226a-227a, 235a (69 Fed. Reg. 41,596, 41,598, 41,600).

[4] EPA, *Economic and Engineering Analysis* (July 20, 2000) ("EPA EEA"), Ch. 11, p. 11-4, Table 11-1, Docket EPA W-00-03, DCN:1-5046-PR, incorporated into Docket EPA-HQ-OW-2002-0049 by reference at DCN:4-0000), J.A. 165-67.

[5] *See, e.g.*, EPA EEA 11-13, Table 11-11 (showing 115,384-fold variation in annual impingement of Atlantic croaker by eight estuarine plants); 11-13, Table 11-10 (showing 3,515-fold variation in entrainment of Atlantic tomcod eggs and larvae by three estuarine facilities); 11-10, Table 11-6 (showing 1,033-fold variation in annual entrainment of alewife by five Great Lakes facilities); 11-9, Table 11-5 (showing 18,750-fold

(continued...)

This is not to say that impingement and entrainment rates at the lower end of the range are necessarily trivial. But the record shows that EPA had good cause to believe that impingement and entrainment rates vary substantially from site to site and may not be as significant at some sites as at the handful of large facilities located on sensitive waterbodies that the Agency presented as examples of power plant intake structure effects.[6]

EPA also understood that not all organisms that become impinged or entrained are harmed by the intake structure. For example, whether an organism's encounter with an intake causes harm, even to that individual, depends on whether the organism is alive on arrival. Many are not, due to the enormously high natural mortality to which

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variation in annual impingement of freshwater drum by four lake or reservoir facilities); 11-6, Table 11-2 (showing 1,101-fold variation in entrainment of sunfish eggs, larvae, and juveniles by five riverine facilities); 11-15, Table 11-13 (showing 19-fold variation in impingement of queenfish by two ocean facilities).

[6] *Compare* Pet. App. 175a-181a (69 Fed. Reg. 41,587-88) *with* UWAG Comments on Proposed § 316(b) Rule for New Facilities 81-87 (Nov. 9, 2000) ("UWAG Phase I Comments"), incorporated by reference per DCN:4-0000 (discussing issues raised by EPA reliance on information for a small group of power plants to derive its estimate of national impacts); *see also* UWAG Comments on Proposed § 316(b) Rule for Existing Facilities, Public Comment 1.041 (Aug. 7, 2002) 15-17 ("UWAG Phase II Comments") (describing site-specific factors that affect impingement and entrainment levels).

aquatic organisms are subject.[7] Equally important, many organisms will survive their encounter with the intake, resulting in no harm even to the individual.[8]

The broader implications of those individual losses depend on the species affected, the size of the population from which the losses occur, and the

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[7] *See, e.g.* EPRI Comments on Proposed § 316(b) Rule for Existing Facilities, Public Comment 1.074 (Aug. 7, 2002) 9, 16; UWAG Phase II Comments at 15. High mortality in wild populations is natural, and due to compensation and other demonstrated natural mechanisms, increased mortality can result in increased production. UWAG Phase I Comments at 32 & App. B; see also EPA's Response to Public Comment, Author Version, DCN:6-5049A ("EPA's Response to Comment") 689-90; *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306, 309 (1st Cir. 1979) ("*Seacoast II*"); *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 & 2)*, 1 E.A.D. 332, 10 Env't Rep. Cas. (BNA) 1257, 1977 EPA App. LEXIS 16, *47 (June 10, 1977), *rev'd on other grounds and remanded, Seacoast Anti-Pollution League v. Costle*, 572 F.2d 872 (1st Cir. 1978) (loss of Mya clam larvae would be 100,000,000,000, but this was at most about 5% of the standing crop of Mya clam in the area, and a single adult clam releases several million eggs per spawning and may spawn several times a years).

[8] Pet. App. 234a-235a (69 Fed. Reg. 41,600) (citing differences in impingement survival rates among species as basis for setting performance standard ranges). *See also In the Matter of Riverkeeper, Inc. v. Johnson*, 2008 NY Slip Op. 5608, 2008 N.Y. App. Div. LEXIS 5503 (N.Y. App. Div. 3d Dep't June 19, 2008) (upholding agency consideration of entrainment survival in setting BTA requirements).

presence of other significant stressors. Some species are so abundant that intake-related losses, even if large in the abstract, are unlikely to affect the species' well-being.[9] Other species are considered a nuisance by state and federal fisheries managers, who do their best to extirpate them.[10]

In short, the extent to which an intake structure causes impingement or entrainment mortality at a particular site and the environmental relevance of any such mortality are highly site-specific. Equally important, such impacts are not the only "environmental impacts" associated with the technology choices under § 316(b). For example, closed-cycle cooling systems can create other adverse environmental impacts such as noise, salt drift, ice, fog, elimination of favorable thermal habitat, and others of which EPA is well aware. *See infra* at 20. Most notably, because retrofitted closed-cycle systems are less efficient than once-through systems

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[9] *See, e.g.*, UWAG Phase I Comments at 172-73 (evaluation of effects of entrainment of Atlantic mackerel by a Northeastern plant showed that annual entrainment of Atlantic mackerel eggs loss equaled less than one millionth the number spawned yearly by that species).

[10] *See, e.g.*, Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, 16 U.S.C. §§ 4701, 4712 (1994); National Invasive Species Act of 1992, 16 U.S.C. §§ 4701-51 (1997); 72 Fed. Reg. 37,459 (July 10, 2007) (U.S. Fish and Wildlife Service lists silver carp as "injurious fish" because they carry pathogens, compete with native species, and degrade habitat).

at removing heat, they extract a significant, permanent "energy penalty," resulting in less electricity per unit of fuel. Pet. App. 254a-261a (69 Fed. Reg. 41,605-06). This means each affected power plant would have a lower output because of the retrofit. This raises serious concerns about the nation's electric supply.[11] The costs of various technological alternatives also are highly site-specific, as EPA recognized. *See, e.g.*, 69 Fed. Reg. 41,670-75 (Appendix A). The Agency made an attempt to capture those costs in its analysis, but it recognized that the assumptions it made might not be correct for any given case. Pet. App. 435a (69 Fed. Reg. 41,647).

B. Section 316(b)

The Agency found legal authority for evaluating costs and benefits at both the national

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[11] Indeed, closed-cycle cooling retrofits, if required, could have a very negative impact on the reliability of the electrical supply system in the United States. The North American Electric Reliability Corp. ("NERC") is charged with overseeing the reliability of the nation's electric supply. NERC's recent assessment of long-term energy found that long-term capacity margins already are inadequate in many regions, and retrofitting existing power plants with closed-cycle cooling pursuant to § 316(b) could result in a 12 percent reduction in available capacity margin, thus compounding an already serious reliability picture. See NERC, 2007 Long-Term Reliability Assessment 2007-2016 at 10, 97 (available at ftp://ftp.nerc.com/pub/sys/all_updl/docs/pubs/LTRA2007.pdf or at http://www.nerc.com/~filez/rasreports.html).

and site-specific levels in the language and legislative history of the statute. Pet. App. 150a-157a (69 Fed. Reg. 41,582-83); Pet. App. 253a (69 Fed. Reg. 41,604); Pet. App. 348a-354a (69 Fed. Reg. 41,625-26).

As EPA recognized, among the provisions of the Clean Water Act that rely on technology to achieve an outcome, § 316(b) is unique. It is the only provision that applies to structures that withdraw water, rather than to discharges that add pollutants to water. Thus, its subject – the location, design, construction, and capacity of cooling water intake structures – is different from the subject of the statute's other technology-based provisions. Pet. App. 156a-157a (69 Fed. Reg. 41,583).

Equally important, unlike the technology-based program for point sources, the goal of which is to "eliminate" pollutant discharges, § 316(b) has a broadly stated objective of "minimizing adverse environmental impact." Section 316(b) does not specify the impacts on which EPA must focus, does not identify the threshold at which impacts are considered "adverse," and does not require that adverse impacts be eliminated wherever it is technologically possible to do so.

There are other differences as well. Section § 316(b) refers to but is structurally removed from the technology-based provisions of §§ 301 and 306, which the Entergy/PSEG Brief describes in some detail. Unlike those sections, it does not require development of several tiers of uniform national

standards for categories and classes of industrial discharges. In fact, § 316(b) does not require categorical or numeric performance standards of any kind.

Section 316(b) does not reside with the Act's technology-based provisions but in a separate section of the Act that, as its title states, addresses "Thermal Discharges." 33 U.S.C. § 1326. The cornerstone of the section is § 316(a), which affords relief from otherwise applicable technology or water quality-based effluent limits for heat where the discharger can demonstrate that alternate thermal limits will ensure the "protection and propagation of balanced, indigenous population of shellfish, fish and wildlife in and on the water to which the discharge is made."[12] Pet. App. 59a, n.27.

By its terms, § 316(b) does not require controls based solely on what technology can achieve, without regard to the environmental outcome. Rather, as the Agency concluded, § 316(b) authorizes EPA "to

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[12] Section 316 was originally included in the House-passed water pollution control bill because "the arguments which justified a basic technological approach to water quality control did not apply in the same manner to the discharges of heat." 1 *A Legislative History of the Water Pollution Control Act Amendments of 1972* (hereinafter *Leg. Hist.*) 263 (93d Cong. 1st Sess.) (1973). Among the reasons offered in support were the relatively local, non-accumulative, and temporary effects of heat in comparison to other pollutants and the potential for thermal discharges in some cases to *enhance* the aquatic environment. *Id.* at 263-64, 267-28.

consider not only technologies but also their effects on and benefits to" the environment. Pet. App. 157a (69 Fed. Reg. 41,583).

Although legislative history on § 316(a) abounds, there is relatively little on § 316(b). Section § 316(b) appeared for the first time in the Conference Committee Report.[13] *See Riverkeeper I* at 186 n.12. The only substantive comment was offered by one of the House floor managers, Representative Don Clausen (R. Calif.), who explained that § 316(b) "is intended to be interpreted to mean the best technology available commercially at an economically practicable cost." 1 *Leg. Hist.* at 264; Pet. App. 252a (69 Fed. Reg. 41,604). This brief discussion places § 316(b) within the tradition of §§ 301, 304, and 306, all of which authorize EPA to weigh costs and benefits.

Thus, while § 316(b) refers to and therefore logically should be read in conjunction with §§ 301, 304, and 306, both its subject (intake structures) and its object (minimizing adverse environmental impacts) are markedly different in ways that EPA

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[13] Indeed, to the best of our knowledge, the only other references to cooling water withdrawals occurred during the debate over § 511(c), 33 U.S.C. § 1371(c), which limits the applicability of the National Environmental Policy Act to specified federal actions under the Clean Water Act. 1 *Leg. Hist.* at 194-98 (Statement of Senator Buckley) and 198-200 (Senator Muskie). (Section 511(c) is in the appendix to this brief.)

was obliged to consider when interpreting and implementing that provision. The Second Circuit itself recognized this in its earlier decision, largely upholding the Phase I § 316(b) rule for new facilities. *See Riverkeeper I* at 193 (recognizing that "intake structures are in a class by themselves").

C. EPA's Long-Standing Approach To § 316(b) Implementation

For over 30 years, EPA has read § 316(b) to authorize permit writers to select BTA on a site-specific basis and to weigh costs and benefits in doing so. The Agency's early rules relied exclusively on site-specific decision-making. J.A. 44 (41 Fed. Reg. 17,387, 17,388 (Apr. 26, 1976). Those rules were set aside on procedural grounds a year later in *Appalachian Power Co.* v. *Train*, 566 F.2d 451, 457 (4th Cir. 1977).

During the next 30 years, until EPA promulgated the rules at issue here, EPA and state permit writers successfully relied on Agency guidance that required permit writers to select BTA site-by-site, taking into account the relationship between costs and benefits.[14] That guidance

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[14] EPA, *Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b)* P.L. 92-500 (May 1, 1977) ("1977 draft guidance"), DCN:1-5045-PR, incorporated into Docket EPA-HQ-OW-2002-0049 by reference at DCN:4-0000), also available at http://www.epa.gov/waterscience/316b/files/1977AEIguid.pdf.

provided permit writers with a general framework for evaluating the potential environmental impacts of existing intake structures, deciding whether those impacts are adverse, and, if they are, selecting the modifications to the structure's location, design, construction, or capacity that best minimizes those impacts at a cost not "wholly disproportionate" to the benefit gained. Pet. App. 161a (69 Fed. Reg. 41,584). The approach embodied in EPA's guidance was approved by the First Circuit in *Seacoast II*, 597 F.2d at 311, and followed in numerous administrative decisions thereafter.

II. The Phase II Rule

A. Background

In the mid-1990s, to resolve a lawsuit filed by environmental groups, EPA entered a consent decree obligating it to initiate § 316(b) rulemaking proceedings, which it did in three phases.[15] The

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[15] EPA's Phase I rule, adopted in 2001, governs new facilities of all kinds, including new steam electric power plants. 66 Fed. Reg. 65,338 (Dec. 18, 2001), as amended at 68 Fed. Reg. 36,754 (June 19, 2003), codified at 40 C.F.R. §§ 125.80-125.89. The Second Circuit reviewed and largely upheld those regulations, including a variance provision allowing consideration of local environmental impacts. *Riverkeeper I* at 174. For a detailed discussion of the Second Circuit's decision in *Riverkeeper I*, *see* Entergy/PSEG Brief, Statement of the Case ("SOC") § A.5.

Phase III encompasses existing power plants and industrial facilities not subject to Phase II. *See* Pet. App. 159a

(continued...)

"Phase II" rule at issue here resulted from that process. Pet. App. 122a-593a (69 Fed. Reg. 41,576). The rule applies to cooling water intake structures at approximately 540 large steam electric generating plants built before January 17, 2002. EPA estimated that Phase II facilities produce about 50% of the nation's electric energy. Pet. App. 203a (69 Fed. Reg. 41,593); EPA, *Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule* A3-12-13 (2004), DCN:6-0002.

EPA's Phase II rule embodies both site-specificity and cost-benefit principles, but with two significant innovations. First, to promote greater consistency and ease administrative burdens on the permit writers responsible for implementing § 316(b), the Phase II rule establishes new nationally applicable performance standard ranges for reducing impingement mortality and entrainment[16] and

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(69 Fed. Reg. 41,583). For these facilities, EPA has determined that uniform national standards are not the most effective way to ensure compliance with § 316(b), opting instead to continue regulating exclusively case-by-case. 71 Fed. Reg. 35,006 (June 16, 2006). The Agency based this determination on its judgment that "the monetized costs associated with the primary option under consideration are wholly disproportionate to the monetized environmental benefits." 71 Fed. Reg. 35,017 (June 16, 2006). Environmental groups have challenged that determination in a case now pending in the Fifth Circuit. *ConocoPhillips v. EPA*, (5th Cir., No. 06-60662, *filed* 7/14/06) (stayed pending outcome of Phase II appeal).

[16] Although EPA recognized that entrained organisms sometimes survive passage through the cooling system, it also

(continued...)

imposes new, more uniform procedural requirements. Those performance ranges and procedural requirements, described in greater detail below, provide a consistent framework for selecting the "most effective and efficient approach and technologies for minimizing adverse environmental impact" at each site, at a cost that is "economically practicable." Pet. App. 226a, 356a (69 Fed. Reg. 41,598, 41,627).

Second, the Phase II rule does not require a threshold evaluation of whether the type and level of impact occurring at a site is truly "adverse" in any meaningful sense. Instead, it addresses that issue through an optional site-specific compliance alternative. That alternative, described in greater detail below, authorizes establishment of alternative performance standards where the overall costs of achieving the national standards exceed the overall benefits.

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recognized that entrainment survival rates are very site-specific. Pet. App. 325a-327a (69 Fed. Reg. 41,620). Therefore, for purposes of setting national standards, the Agency assumed that no survival occurs and established standards for entrainment *per se*, rather than for intake-induced entrainment mortality. However, as discussed below, it allowed consideration of facility-specific entrainment survival through the site-specific cost-benefit provision. Throughout this brief, we will refer to "impingement," "impingement mortality," "entrainment," and "entrainment mortality" as the context demands.

For purposes of setting national standards in the Phase II rule, the Agency chose not to draw distinctions (though it could have) based on the type of species affected, the life stages affected, the size of the losses, or the effects on the ecosystem. Instead, it took a precautionary approach, based on its national findings about the likely benefits of reducing impingement mortality and entrainment, the acceptability of the other environmental and energy impacts that would impose, and the associated costs of achieving the required reductions. Pet. App. 249a-252a (69 Fed. Reg. 41,603-04); *see also* 247a-249a (69 Fed. Reg. 41,603). To avoid irrational or counterproductive results at the site-specific level, however, EPA included provisions allowing site-specific standards based on actual costs and benefits. *Id.*

Besides the regulatory option it chose, EPA considered a number of others. Several were wholly site-specific. EPA rejected these in favor of an approach that promoted consistency, reduced administrative burdens, and decreased the likelihood of disputes and delay in the permit process. Pet. App. 268a-269a (69 Fed. Reg. 41,608).

It also considered and rejected several options requiring all or some existing facilities with once-through cooling to retrofit closed-cycle systems, which would reduce flow substantially and, EPA estimated, achieve a comparable reduction in

entrainment and, in some cases, impingement.[17] Pet. App. 287a-289a (69 Fed. Reg. 41,612). Although recognizing that the reduction in impingement and entrainment achievable by closed-cycle cooling could be greater in some cases than was achievable from technologies directly applicable to the intake structure, such as barriers, behavioral devices, or screening, EPA chose not to base the Phase II standards on closed-cycle cooling. Pet. App. 254a-273a (69 Fed. Reg. 41,605-09).

EPA based this choice partly on its conclusion that "other technologies approach the performance of [closed-cycle cooling]," Pet. App. 255a (69 Fed. Reg. 41,605), at about one-ninth the cost of closed-cycle cooling. *Compare* Pet. App. 256a (69 Fed. Reg. 41,605) (total social cost for cooling towers about $3.5 billion per year, not counting land acquisition) *with* Pet. App. 450a (69 Fed. Reg. 41,650) (total social cost for Phase II rule of $389 million per year). Other factors also influenced EPA's decision: the huge plant-specific and national cost of retrofitting existing facilities with closed-cycle cooling; the energy penalties associated with retrofitting existing

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[17] EPA found that entrainment is related to flow, and impingement is related to a combination of flow, intake velocity, and fish swim speed, and that installing flow reduction technologies would result in a similarly high reduction in impinged and entrained organisms. Pet. App. 288a-289a (69 Fed. Reg. 41,612).

facilities;[18] increases in air emissions from additional generation needed to compensate for such penalties; the fact that retrofitting might be impossible at some plants; and other adverse environmental effects, such as fog, icing, and noise. *See* Pet. App. 255a-259a (69 Fed. Reg. 41,605-06).

In other words, the Agency considered overall costs, weighed them against overall benefits, and concluded that the approach it chose was the best way to minimize adverse environmental impacts overall. Pet. App. 169a (69 Fed. Reg. 41,586).

In fact, EPA adopted a Phase II rule that would produce benefits at a relatively high cost. The Agency performed a cost-benefit analysis of the rule, as required by Executive Order 12866. That analysis estimated that the costs of the Agency's chosen alternative exceeded the quantifiable benefits by almost 5-to-1. Pet. App. 526a (69 Fed. Reg. 41,666) (total pre-tax social costs of $389.2 million and total use benefits of $82.9 million).

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[18] For existing facilities, the Department of Energy estimated that retrofitting closed-cycle cooling at existing facilities would impose an energy penalty ranging from 2.4 to 4 percent (or, at one plant, over 5 percent) of existing generating capacity, requiring the construction of approximately 20 additional 400-megawatt power plants to replace that lost capacity. Pet. App. 257a-258a (69 Fed. Reg. 41,605). The "net effect" of the energy penalty would be more consumption of fossil fuel, which in turn increases emissions of carbon dioxide, sulfur dioxide, NOx, mercury, and other pollutants. Pet. App. 258a (69 Fed. Reg. 41,605).

B. National Standards

The rule sets national standards requiring all Phase II facilities to substantially reduce the "impingement mortality" that can occur when aquatic organisms become trapped against the intake structure. EPA found that "best technology" varies among sites but is reflected by national performance standards that require all Phase II plants to reduce impingement mortality by 80-95% from an uncontrolled or "calculation baseline" level. Pet. App. 560a (40 C.F.R. § 125.94(b)(1)).

The Phase II rule also requires some facilities to reduce "entrainment" of very small aquatic organisms (usually eggs and very small larvae) that are drawn into the facility's cooling system through the intake. The Agency concluded that entrainment levels could be significant enough to warrant regulation at facilities that (1) have a "capacity utilization rate" of 15% or greater, and (2) are located on oceans, estuaries, tidal rivers or the Great Lakes, or are located on a freshwater stream or river (but only if the plant has a design flow of 5% or greater of the mean annual flow of river or stream). Pet. App. 229a-234a (69 Fed. Reg. 41,599-600). These facilities must reduce entrainment 60-90% from the calculation baseline. Pet. App. 560a (40 C.F.R. § 125.94(b)(2)). For other facilities, the Agency decided that the risks from entrainment were not sufficient to justify additional controls – a decision that no party challenged.

The Agency focused on impingement mortality and entrainment as a "quick, certain, and consistent metric for determining performance at Phase II existing facilities." Pet. App. 168a-188a (69 Fed. Reg. 41,586-90). But because EPA recognized that the availability, performance, cost, and environmental effects of intake technology alternatives varied significantly by site, the Agency did not base its performance standards on a single technology. Pet. App. 216a, 226a, 234a-235a (69 Fed. Reg. 41,596, 41,598, 41,600). Instead, the standards are based on a suite of commercially available technologies, including fine- and wide-mesh screens, aquatic filter barriers, barrier nets, and fish return systems. Pet. App. 226a-228a (69 Fed. Reg. 41,598-99).

C. Site-Specific Standards

To provide a "level of flexibility comparable" to its long-standing site-specific approach, EPA also included a provision allowing permit writers to set site-specific alternative performance standards where a facility can demonstrate that the overall costs of achieving the national standards exceed the overall benefits. Pet. App. 269a (69 Fed. Reg. 41,608); Pet. App. 556a-560a (40 C.F.R. § 125.94(a)(5)(ii)). Alternate standards set under this provision must be as close as practicable to the national standard without resulting in significantly greater costs than benefits.

To qualify, a facility must submit a "Benefits Valuation Study" fully valuing the impacts of

impingement mortality (and, where applicable, entrainment) at its site, and providing a quantitative and qualitative assessment of all of the benefits (recreational, commercial, and ecological) of achieving applicable national standards. Pet. App. 579a-581a (40 C.F.R. § 125.95(b)(6)(ii)). Facilities subject to entrainment standards may document entrainment survival and factor that survival into the Benefits Valuation Study. Pet. App. 579a (40 C.F.R. § 125.95(b)(6)(ii)((B)). In fact, this is the only point in the rule at which entrainment survival can be considered. To avoid any bias in the benefits estimate, the rule authorizes a permit writer to require an applicant to provide at its own expense an independent peer review of the Benefits Valuation Study. Pet. App. 580a (40 C.F.R. § 125.95(b)(6)(ii)(D)). The rule also requires the applicant to explain how the uncertainties involved in benefits estimation will be identified and factored into the assessment. Pet. App. 579a (40 C.F.R. § 125.95(b)(6)(ii)(C)).

An applicant for alternate limits also must submit a "Comprehensive Cost Evaluation Study." The rule does not limit the types of costs that can be considered to only those economic costs borne by the permittee. It simply requires submission of "engineering cost estimates" (Pet. App. 578a-579a (40 C.F.R. § 125.95(b)(6)(i)), an undefined term that is broad enough to encompass estimates for a variety of different costs, whether borne by the facility, society, or the environment. Ultimately, according to the rule, the determination regarding any site-specific alternative limitation must be made based

on "reliable, scientifically valid cost and performance data" submitted by the facility "and any other information the Director deems appropriate." Pet. App. 559a (40 C.F.R. § 125.94(a)(5)(ii)).

All of this information must be submitted as part of the facility's "Comprehensive Demonstration Study," which becomes part of its NPDES permit renewal application. Pet. App. 564a-582a (40 C.F.R. § 125.95(a), (b)). As such, it becomes part of the public record, available for review and comment.

III. The Decision Below

The Second Circuit invalidated the Phase II rule based on its own highly selective interpretation of § 316(b) and §§ 301 and 306, to which § 316(b) refers.[19] Although the circuit court stated that EPA may consider technology cost and must consider technology performance in selecting BTA at the national level, it held that § 316(b) forbids any comparison of the two. Pet. App.20a-33a. Instead, EPA must select the technology that achieves the greatest reduction in impingement mortality and entrainment, unless the Agency finds that the industry cannot "reasonably bear" its cost. Pet. App. 26a-27a. The court also prohibited EPA from allowing site-specific variation from the national standards based on cost-benefit evaluation, reasoning that weighing costs and benefits is

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[19] For a detailed discussion of the basis for the Second Circuit's decision, see Entergy/PSEG Brief, SOC § B.

generally prohibited and, applied on a site-specific basis, would involve consideration of forbidden "water quality" factors. Pet. App. 56a-60a.

The court agreed that EPA may consider energy and non-water quality impacts in selecting BTA (Pet. App. 26a n.12). But its decision strongly suggests that EPA may not use any form of economic cost-benefit analysis as a means of balancing those competing factors and selecting the alternative that best "minimizes adverse environmental impact" overall, even though the definition of "cost-benefit analysis" cited by the court suggests that is a task for which such an analysis is ideally suited. *Cf.* Pet. App. 23a n.10 (citing OMB circular describing cost-benefit analysis as a "systematic quantitative method of assessing the desirability of government ... policies when it is important to take the long view of future effects and a broad view of possible side-effects") (internal citations omitted).

SUMMARY OF THE ARGUMENT

The Second Circuit's decision misreads § 316(b) and the other technology-based provisions of the Clean Water Act, ignores the legislative history, and misapplies this Court's precedents to reach a conclusion that is inconsistent with § 316(b)'s mandate.

Section 316(b) does not forbid EPA to compare costs and benefits on either a national or site-specific basis. As the Entergy/PSEG Brief demonstrates, § 316(b), read both alone and within the broader

structure of the Act, clearly permits EPA to weigh costs and benefits in regulating cooling water intake structures. UWAG agrees with and adopts the arguments presented by Entergy and PSEG.

At the very least, however, § 316(b) is ambiguous as to EPA's authority to weigh costs and benefits in setting national standards or in making site-specific BTA determinations. Other than requiring EPA to focus on the "location, design, construction, and capacity" of cooling water intake structures, and to "minimize" those "environmental impacts" that are "adverse," § 316(b) is silent on the factors to be considered and how they should be considered. EPA's interpretation of § 316(b) was entirely reasonable and thus was entitled to deference under *Chevron*. The Second Circuit's decision gave it none; indeed, the court makes almost no mention of EPA's interpretation. Instead, the court's decision upsets 30 years of Agency interpretation and precedent and denies EPA the deference to which it is due when interpreting a statute the Agency is charged with administering.

The Second Circuit's cost-benefit decision places a harmful and artificial limit on EPA's thinking. As the discussion above of EPA's findings shows, the Agency knew that saving some fish is more important than saving others; that installing some equipment to save fish, in some places, will harm the environment or at least have no worthwhile overall effect; and that some equipment that saves fish will also reduce electric supply and increase air pollution. All these are relevant to "best

technology available" for "minimizing adverse environmental impact."

Yet the reasoning underlying the Second Circuit's decision suggests that EPA is inappropriately restricted from thinking about these things in certain ways. It may not consider, for example, how intake technologies increase air pollution, increase undesirable fish, or harm electric supply *if* considering them would involve translating those costs and benefits into economic terms for comparison. This restriction on an agency's deliberative process is irrational. The various "factors" (all of which can be thought of as either "costs" or "benefits") must assuredly be compared to one another at some point, and cost-benefit analysis is one tool for making such comparisons. Is it not a requirement of rational decision-making that EPA consider, for example, that a large increase in air pollution would produce only a minimal improvement in a fish population? And is not that comparing "costs" to "benefits"?

It is inconceivable that Congress intended to impose irrational limits on EPA's thinking, especially where such limits would undercut the statutory objective (minimizing adverse environmental impact). If that is what Congress intended, there would be clear evidence of it in the statute or legislative history. But there is none.

ARGUMENT

Judicial review of an agency's interpretation of a statute that the agency is charged with administering proceeds under the familiar two-step procedure articulated in *Chevron*. At step one of a *Chevron* analysis, reviewing courts must examine the text of the statute and ask "whether Congress has directly spoken to the precise question at issue." *Chevron*, 467 U.S. at 842. If it has, then the "inquiry is at an end" and the agency must follow Congress's command. *See FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 132 (2000).

If a court determines that the statute is ambiguous, however, the inquiry moves to step two of *Chevron*'s test. At step two, a court must defer to the agency's interpretation of an ambiguous provision so long as it represents "a reasonable policy choice for the agency to make," *Chevron*, 467 U.S. at 845, and is thus a "permissible" construction of the statute. *Id.* at 843. This can be framed as an aspect of statutory interpretation and of the requirement that agencies engage in reasoned decision-making. *Compare NationsBank of N.C. v. Variable Annuity Life Ins. Co.*, 513 U.S. 251, 257 (1995) (citing *Chevron*, 467 U.S. at 844) ("If the administrator's reading fills a gap or defines a term in a way that is reasonable in light of the legislature's revealed design, we give the administrator's judgment 'controlling weight.'") *with Smiley v. Citibank (S.D.), N.A.*, 517 U.S. 735, 741 (1996) (citing *Chevron*, 467 U.S. at 844) ("In its logic, at least, the line [drawn by

the agency] is not 'arbitrary [or] capricious,' and thereby disentitled to deference under *Chevron*.").

Review at step two is deferential. The court may not "simply impose its own construction on the statute, as would be necessary in the absence of an administrative interpretation." *Chevron*, 467 U.S. at 843. It must affirm an agency's interpretation even if it is not the best interpretation of a statute or the interpretation that the court would have devised. *See id.* at 843 n.11. The rationale for agency deference is clear. As this Court has explained, *Chevron* is based upon "a presumption that Congress, when it left ambiguity in a statute meant for implementation by an agency, understood that the ambiguity would be resolved, first and foremost, by the agency, and desired the agency (rather than the courts) to possess whatever degree of discretion the ambiguity allows." *Smiley v. Citibank*, 517 U.S. at 740-41 (citing *Chevron*, 467 U.S. at 843-44).

Under *Chevron*, deference to reasoned agency decision-making is particularly appropriate where the statute at issue is highly technical or complex. *Chevron*, 467 U.S. at 865 (1984); *see also Nat'l Cable & Telecomms. Ass'n* v. *Brand X Internet Servs.*, 545 U.S. 967, 1002-03 (2005); *Barnhart* v. *Walton*, 535 U.S. 212, 222 (2002); *Pauley* v. *BethEnergy Mines*, 501 U.S. 680, 697 (1991). As this Court has explained, the Clean Water Act is exactly the type of "very complex statute" for which *Chevron* deference is particularly appropriate. *See Chemical Mfrs. Ass'n* v. *NRDC*, 470 U.S. 116, 125 (1985). Accordingly, courts regularly defer to the EPA's expertise in

construing silent or ambiguous provisions of the CWA. *See, e.g.*, *Arkansas* v. *Oklahoma*, 503 U.S. 91, 112-14 (1992) (reversing Court of Appeals decision to invalidate Clean Water Act permit issued by EPA because that court failed to defer to EPA's interpretation of its water quality regulation and therefore "made a policy choice that it was not authorized to make"); *United States* v. *Pozsgai*, 999 F.2d 719, 729 (3d Cir. 1993) (giving deference to Army Corps of Engineers interpretation of Clean Water Act because, "[l]ike the Clean Air Act in *Chevron*, the Clean Water Act addresses a scientifically complicated subject, and has an intricate regulatory structure").

I. EPA's Interpretation of § 316(b) as Authorizing Cost-Benefit Analysis Is Entitled to Deference

Reviewing the language of § 316(b) itself, and the full statutory context, the only conclusion that can be drawn is that, for the reasons given by Entergy and PSEG, the provision unambiguously permits EPA to weigh costs and benefits. If this Court concludes otherwise, however, then, at the very least § 316(b) is silent, and therefore ambiguous, on the issue; it certainly does not unambiguously forbid the Agency to weigh costs and benefits. EPA's interpretation of § 316(b) to authorize cost-benefit analysis both at the national and site-specific level is entirely consistent with a reasonable, common sense interpretation of § 316(b), and the Second Circuit erred in not deferring to the Agency's interpretation.

A. The Second Circuit's Interpretation Is Not Dictated by Statutory Language or Precedent

1. The Wording of Section 316(b) Does Not Foreclose Cost-Benefit Analysis

As the Second Circuit itself recognized in *Riverkeeper I*, the paucity of legislative history, combined with the brevity of the section itself, "counsels against imputing much specific intent to Congress beyond the section's words themselves." *Riverkeeper I* at 187 n.12. Thus, "[t]o the extent the provision is silent on issues to which other sections speak" (such as EPA's authority to consider costs and benefits under § 316(b), "we hesitate to draw the negative inference that the brevity of section 316(b) reflects an intention to limit the EPA's authority rather than a desire to delegate significant rulemaking authority to the Agency." *Id.*

If such a prohibition exists, then, it must be apparent from the terms Congress used in § 316(b). That those terms do *not* unambiguously prohibit balancing costs and benefits finds support in the same arguments presented by Entergy and PSEG demonstrating why § 316(b) is best read as unambiguously *authorizing* cost-benefit balancing. In Section II.A of their Argument, Petitioners Entergy and PSEG discuss in detail the ordinary meaning of "best," "available," "minimize," and "adverse environmental impact." As that analysis demonstrates, the ordinary meaning of all these

terms, individually and collectively, is entirely consistent with EPA's use of cost-benefit analysis in selecting BTA at the national level and at specific sites.

Focusing further on the phrase "minimize adverse environmental impact," nothing in the statute suggests, as the Second Circuit assumed, that Congress intended a single-minded focus on reducing impingement and entrainment as much as physically possible. *See* Pet. App. 26a (assuming "best" means "most effective" or "optimally best performing" at reducing impingement mortality and entrainment).

That EPA chose impingement mortality and entrainment as a measure of "adverse environmental impact" does not mean that it forfeited the right to weigh other factors in deciding when "adverse environmental impact" in the broader sense occurs and when it is minimized. As EPA was careful to explain, its decision to set national standards did not limit its discretion to decide that environmental impacts are "minimized" at something less than those standards.[20] Pet. App. 356a (69 Fed. Reg. 41,627).

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[20] Indeed, in the Phase I rule, EPA adopted a regulatory definition of "minimize" that accommodates cost-benefit balancing to decide what level of additional control is "reasonably possible." *See* 40 C.F.R.§ 125.83 (defining "minimize" for purposes of the Phase I rule as meaning "reduce

(continued...)

Had the Second Circuit examined the phrase "adverse environmental impact," it would have found no bar to EPA's interpretation. "Adverse" commonly means "contrary to one's interests or welfare; harmful or unfavorable." *American Heritage Dictionary of the English Language* (4th ed. 2000). "Environmental" means "relating to or being concerned with the ecological impact of altering the environment." *Id.* And definitions of "impact" include "the force or impression of one thing on another: a significant or major effect." *Merriam-Webster's Collegiate Dictionary* (10th ed. 1996). Collectively, they suggest Congress's intent to reduce significant effects that have ecological impact and that are contrary to the interests of the "environment" writ large.

It is eminently reasonable to use cost-benefit comparisons to decide when such effects have occurred and at what point they are "minimized." In short, the objective of § 316(b) is not so narrow that it suggests a Congressional intent to forbid cost-benefit comparisons, as the Second Circuit assumed. Indeed, §§ 301, 304, and 306 are designed to make progress toward the far more precise and demanding goal of "eliminating pollutant discharges," but, as explained below, even those provisions permit cost-benefit comparisons.

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to the smallest amount or degree reasonably possible"). This provision was not challenged and remains in effect today.

2. The Second Circuit's Reliance on *Crushed Stone* Was Misplaced

In finding an unambiguous intent to prohibit cost-benefit analysis, the Second Circuit largely ignored the specific requirements of § 316(b). Instead, it drew a strict analogy between § 316(b) and the BAT ("best available technology" economically achievable) and BADT ("best available demonstrated control technology") requirements of §§ 301(b)(2) and 306(b)(1)(B). Having drawn this analogy, it misinterpreted this Court's decision in *EPA v. Nat'l Crushed Stone*, 449 U.S. 64 (1980), which construed those provisions, as "strongly suggest[ing] that cost-benefit analysis is no longer permitted under those sections...." Pet. App. 23a.

Nothing in *Crushed Stone* supports the Second Circuit's rejection of EPA's interpretation of § 316(b). There, this Court examined whether the Clean Water Act *requires* EPA to provide a variance from BPT ("best practicable control technology" currently available) limits that prove too expensive for a facility to afford. The Fourth Circuit had ruled that EPA was required to provide such a variance to account for individual affordability, because § 301(c), the BAT variance provision, required it.

This Court disagreed, holding that EPA was not required to provide a BPT variance based on affordability. The Court reasoned that because the statute *requires* EPA to weigh costs and benefits when setting BPT requirements, those requirements

embodied EPA's judgment that the costs, including some individual closures of clearly deficient plants, were necessary to make reasonable further progress and thus were worth the benefits.

In reaching this conclusion, this Court noted in passing that "[s]imilar directions are given the Administrator for determining effluent reductions attainable from the BAT except that in assessing BAT total cost *is no longer to be considered* in comparison to effluent reduction benefits." *Crushed Stone*, 449 U.S. at 71 (emphasis added). The Court then cited remarks made by Senator Muskie describing the BPT standard and noting that the BAT provision "lists 'cost' as a factor to consider in assessing BAT, although it does not state that costs shall be considered in relation to effluent reduction benefits." *Id.* at 71 n.10 (internal citations omitted). The Second Circuit misread this Court's remark as tantamount to a statement that, in assessing BAT, total cost *may no longer be considered* in relation to effluent reduction benefits. But that is not what the Court said, nor is that how its decision has been read by other courts. *See* Entergy/PSEG Brief, Argument § II.B.1.

The Court simply never considered whether EPA had discretion to weigh costs and benefits in setting BAT where it deemed such consideration appropriate, because that was not the issue before it. Indeed, later in its decision, the Court recognized that the § 301(c) variance provides for exactly that sort of balancing in adjusting BAT requirements on a

site-specific basis. *See Crushed Stone*, 449 U.S. at 77 n.16.

B. The Phase II Rule Embodies the Same Reasonable Policy Choice EPA Has Made for the Past 30 Years

Given that § 316(b) is at least ambiguous on the subject of EPA's authority to weigh costs and benefits, the question presented under step two of *Chevron* is whether EPA's conclusion that such analysis is permitted by the Act is reasonable. It is.

As Entergy and PSEG have shown in their brief, § 316(b), read both alone and within the broader structure of the Act, clearly permits EPA to weigh costs and benefits in regulating cooling water intake structures. The same analysis supports the conclusion that EPA's interpretation is reasonable.

EPA's interpretation here is consistent with the same principles of site-specificity and cost-benefit balancing that the Agency has applied for the past 30 years without challenge by any court or change by Congress. The longevity of EPA's interpretation and its widespread application for so many years warrant special deference, as this Court has recognized. *See, e.g., Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 487 (2004) (the Court "normally accord[s] particular deference to an agency interpretation of 'longstanding' duration"); *Barnhart v. Walton*, 535 U.S. 212, 220 (2002) (quoting *North Haven Bd. of Ed. v. Bell*, 456 U.S. 512, 522 n.12 (1982), recognizing that "well-reasoned views" of an expert

administrator rest on "'a body of experience and informed judgment to which courts and litigants may properly resort for guidance'"); *Bragdon v. Abbott*, 524 U.S. 624, 642 (1998) (quoting *Skidmore v. Swift & Co.*, 323 U.S. 134, 139-40 (1944)).

In developing the Phase II rule, EPA did not write on a blank slate. As discussed above, the Agency adopted a § 316(b) rule in 1976, only to have it remanded on procedural grounds a year later. *See supra* at 15. The 1976 rule, unlike the rule at issue here, made no attempt to set national standards. J.A. 38-49 (41 Fed. Reg. 17,387-90 (Apr. 26, 1976) (cited in Pet. App. 159a-162a (69 Fed. Reg. 41,583-84)). Instead, the 1976 rule required that the best technology available be determined by evaluating the specifics of each plant and its site, including the size and type of waterbody and relative magnitude of flow withdrawn.

The Agency took a broad view of what permit writers ought to consider in determining whether an adverse environmental impact exists and when it is minimized. The number of organisms affected and the potential for population impacts were both factors it said were relevant. J.A. 45 (41 Fed. Reg. 17,389). It explained that, once a permit writer has identified adverse environmental impacts for a given site, its task is to identify economically practicable technologies for the individual facility and to select from among them the most effective at minimizing the adverse environmental impacts identified. J.A. 41-42 (41 Fed. Reg. 17,388). Although EPA said that § 316(b) does not *require* permit writers to conduct a

cost-benefit analysis before selecting BTA, it did not suggest that permit writers were forbidden to compare costs and benefits if they chose to when deciding which technologies are the most effective at minimizing adverse environmental impact. *Id.*

The Agency also concluded that closed-cycle cooling systems were not "universally and necessarily the best technology available," finding that the available data did not support requiring their use even for plants on biologically sensitive waters. J.A. 43-44 (41 Fed. Reg. 17,388).

EPA later supplemented its initial § 316(b) rule with draft § 316(b) guidance.[21] Although never finalized, the 1977 draft guidance is important because it has been widely followed by state and federal permit writers, and its principles are reflected in hundreds of individual § 316(b) decisions.

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[21] The 1977 draft guidance (p. 11) states as follows:

> Adverse aquatic environmental impacts occur whenever there will be entrainment or impingement damage as a result of the operation of a specific cooling water intake structure. The critical question is the magnitude of any adverse impact. The exact point at which adverse aquatic impact occurs at any given plant site or water body segment is highly speculative and can only be estimated on a case-by-case basis by considering the species involved, magnitude of the losses, years of intake operation remaining, ability to reduce losses, etc.

The 1977 draft guidance acknowledges that the "adverse impact" of cooling water intakes is site-specific and directs permit writers to make design, location, construction, and capacity decisions case-by-case. 1977 draft guidance at 4 n.12. It suggests a general process for decision-making, starting with a site-specific study, which is used to determine whether, based on the magnitude of the impact, the facility needs to make changes for minimizing adverse environmental impact. *Id.* at 11-14, discussed at Pet. App. 161a (69 Fed. Reg. 41,584).

Besides the 1977 draft guidance, the Agency issued a variety of decisions and opinions reflecting its interpretation of § 316(b). Most important for this case was the Administrator's decision involving a § 316(b) determination for the Seabrook generating station. *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 and 2)*, 1 E.A.D. 455, 1978 EPA App. LEXIS 17 (1978), *aff'd, Seacoast II*, 597 F.2d at 311. There, the Administrator confirmed that § 316(b), while not requiring a cost-benefit analysis to justify BTA requirements, does not require selecting the technology that most reduces impingement and entrainment mortality, if its cost would be wholly disproportionate to the benefits obtained (that is, the number of organisms spared or the effects of reduced losses on the waterbody). EPA's General Counsel subsequently endorsed the Administrator's determination. *In re Central Hudson Gas & Elec. Corp., et al.* Opinion No. 63, July 29, 1977, 1977 WL 28250 (E.P.A.G.C.) at *9-10 (explaining that it would be "unreasonable to interpret Section 316(b) as requiring use of a technology whose cost is wholly

disproportionate to the environmental benefit to be gained").

In permitting decisions over the past 30 years, EPA and the states have relied on this "wholly disproportionate" test to make § 316(b) decisions. [22] Until now, no court has ever found fault with that approach. On the contrary, the courts have supported it. *Seacoast II*, 597 F.2d at 311; *United States Steel Corp. v. Train*, 556 F.2d 822, 850 (7th Cir. 1977) ("we trust that EPA will conduct a limited cost-benefit analysis" for a steel mill under § 316(b)).

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[22] *See, e.g., In re Dominion Energy Brayton Point, LLC (formerly USGen New England, Inc.) Brayton Point Station*, NPDES 03-12, 2006 EPA App. LEXIS 9, *87-88, 132-33 (EAB February 1, 2006); *In the Matter of Dynegy Northeast Generation, Inc.* (Danskammer Generating Station), 2006 N.Y. ENV LEXIS 23, *19 (Deputy Commissioner, NY Dep't Envtl. Conservation, May 24, 2006) (describing New York's approach for selecting BTA, including a determination about whether the costs of practicable technologies are wholly disproportionate to the environmental benefits conferred by such measures), appeal dismissed on procedural grounds, *Hudson Riverkeeper Fund v. Orange & Rockland Utils.*, 835 F. Supp. 160, 165-66 (S.D.N.Y. 1993); *Athens Generating Co.*, 2000 WL 33341184 (N.Y. Dep't Envtl. Conservation, June 2, 2000) at *10-11 (applying a "wholly disproportionate" cost-benefit standard, which is met where "the relative costs are unreasonable"); *see also* the cases cited in UWAG's Petition for Writ of Certiorari, No. 07-597 at 21-22 (Nov. 2, 2007).

II. EPA Reasonably Concluded that § 316(b) Permits Site-Specific Cost-Benefit Consideration

The compliance option authorizing alternative standards where justified by site-specific costs and benefits provides for balanced, environmentally protective decision-making. To obtain an alternative standard, the applicant must demonstrate that the costs (which, as noted above, encompass more than just the facility's out-of-pocket costs) are "significantly greater"[23] than all the benefits that would occur if the national standards were met.

The rule requires the permittee to submit qualitative and quantitative information and allows balancing of both. It requires consideration of the benefit of reducing impingement mortality and entrainment not only to commercial and recreational fisheries, but to the ecosystem. And it provides for independent evaluation of uncertainty, which will need to be taken into account in reaching a decision. By its terms, it does not require rigid, mechanistic decision-making based solely on economics. Instead,

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[23] EPA chose the phrase "significantly greater" (instead of the "wholly disproportionate" test EPA has used in the past, both in guidance and in the Phase I rule) to signal its understanding that existing facilities have less flexibility in selecting locations and technologies, that the rule will affect a much larger portion of the generating capacity, and that a slightly less extreme standard will avoid "economically impracticable impacts on energy prices." 68 Fed. Reg. 13,541 (Mar. 19, 2003).

it allows decision-makers to weigh all the costs against all the benefits and to choose the best option based on local resource management priorities. As the Department of Energy commented, supporting the concept of site-specific requirements using the cost-benefit test, State or regional permit writers, who can appreciate the site-specific nature of any adverse environmental impact, would have the final say on site-specific requirements rather than having the decision-making reside with the federal government. EPA's Response to Comment 181.

By allowing for comparison of all costs and all benefits, the cost-benefit provision affords the rule's only mechanism for testing EPA's assumption that the environmental benefits of reducing impingement mortality and entrainment will outweigh other adverse environmental impacts created by an intake alternative.

The Second Circuit did not say that § 316(b) prohibits case-by-case decision-making *per se*. In fact, in *Riverkeeper I*, the court agreed with EPA that § 316(b) does not require uniform, categorical rulemaking. *See Riverkeeper I* at 203 (finding no textual bar to case-by-case application of § 316(b) and upholding rule requiring such individual decisions for some new facilities). As the court acknowledged, "the Clean Water Act does not forbid the EPA from addressing certain environmental problems on a case-by-case basis, ... when it does not violate the statute's language and is otherwise consistent with Congress's overriding goal of improving the quality of the nation's waters." *Id.*

Other courts have consistently agreed that EPA may implement § 316(b) case by case. *See Hudson Riverkeeper Fund*, 835 F. Supp. at 165; *Appalachian Power Co.*, 566 F.2d at 457 (stating in dicta that "we do not fault EPA for its point source by point source application").

Nevertheless, the Second Circuit invalidated EPA's carefully crafted provision authorizing establishment of site-specific standards based on cost-benefit comparison. Besides relying on its conclusion that § 316(b) does not permit cost-benefit analysis in any case (Pet. App. 57a-58a), the court gave two other reasons.

First, the court concluded that allowing site-specific cost-benefit analysis impermissibly authorizes EPA to consider local water quality conditions (or, for § 316(b) purposes "wildlife levels") – an approach the court said Congress rejected when it established the technology-based program for pollutant control. Pet. App. 58a-59a. Second, it construed the existence of a specific water quality-based variance for heat in § 316(a), and the absence from § 316(b) of a comparable provision, as evidence that Congress intended no consideration of local water quality factors under § 316(b). Pet. App. 59a n.27.

A. Other Clean Water Act Sections Do Not Foreclose Site-Specific Cost-Benefit Analysis Under § 316(b)

By its terms, § 316(b) authorizes, rather than prohibits, consideration of site-specific environmental conditions, including "wildlife levels," in selecting BTA. This is apparent both from Congress's focus on the "location, design, construction, and capacity" of the cooling water intake structure (all of which involve inherently local considerations and trade-offs, particularly for facilities which already exist), and its mandate that EPA require the best technology available for "minimizing *adverse environmental impact*."

That phrase is indisputably broad enough to authorize EPA to consider what an intake structure's environmental impacts (to the waterbody or any other parts of the environment) are, to evaluate whether they are adverse, and to decide at what point they have been "minimized." To suggest that EPA is barred from allowing federal and state permit writers to make site-specific assessments if necessary to address these factors is wholly implausible.

The Second Circuit did not base its interpretation on the language of § 316(b). Instead, the court relied on case law describing Congress's general dissatisfaction with the purely water quality-based regulatory scheme in place before 1972 and its desire to replace that program with technology-based regulations focused on controlling discharges of

pollutants. Pet. App. 58a-60a, citing *Riverkeeper I* at 189-190 (citing, *inter alia,* the Second Circuit's statement in *Bethlehem Steel Corp. v. EPA*, 538 F.2d 513, 515 (2d Cir. 1976), that Congress intended to "replace or supplement" the water quality standards program with "effluent limitations" as basis for setting aside restoration provisions).

Courts generally have agreed that the language and history of the technology-based requirements for the reduction of pollutant discharges indicate that EPA is not *required* to consider local water quality conditions when setting such controls. But until *Riverkeeper II*, no court had suggested that Congress intended to bar EPA from considering water quality in setting discharge controls. To the contrary, in at least one case, *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554 (D.C. Cir. 2002), the circuit court upheld EPA's authority to decline to set categorical limits for color discharged by pulp and paper mills "because the potential for significant ... impacts from color discharges is driven by highly site-specific conditions." *Id.* at 556.

Even if §§ 301, 304, and 306 did forbid consideration of local water quality in setting technology-based discharge limitations, transferring that conclusion to § 316(b) would be an error, given the material differences between § 316(b) and the other provisions.

One of the most obvious differences is between the activity regulated by § 316(b) and activity regulated under the other provisions. Sections 301,

304, and 306 focus on controlling pollutant discharges in order to reduce or eliminate their introduction into the environment. In contrast, § 316(b) focuses on the effects of structures *specifically designed to interact with the environment.* Presumably, Congress chose different language to distinguish between the two programs.

Another obvious difference is between the goal Congress established for the pollutant discharge control program and the objective it set in § 316(b). The former expressly strives to eliminate the discharge of pollutants, without regard to the environmental outcome (subject, of course, to the water quality-based variances for heat and non-conventional/non-toxic pollutants that Congress established in §§ 316(a) and 301(g), respectively). (Section 301(g) is in the appendix to this brief.) By contrast, § 316(b) focuses expressly on the environmental impact of the intake technology, requiring that it be the best for "minimizing adverse environmental impact." That objective is broadly written – quite unlike the narrowly focused goal of "eliminating point source discharges."

Also, the structural choice Congress made in setting § 316(b) apart, along with § 316(a), is significant. Having acknowledged this structural difference in *Riverkeeper I*, the Second Circuit barely mentions it in *Riverkeeper II*. *Compare Riverkeeper I* at 186 *with Riverkeeper II* at 90 (Pet. App. 4a-5a).

B. The Relationship Between § 316(a) and § 316(b) Supports EPA's Use of Site-Specific Cost-Benefit Analysis Under § 316(b)

Contrary to the Second Circuit's reasoning and for the reasons Entergy and PSEG point out, it is implausible to believe that Congress, knowing of the link between thermal discharges and intake structures, would have provided a water quality-based variance for the discharge while ordering the Agency to ignore local water quality conditions in regulating the intake side. *See* Entergy/PSEG Brief, Argument § II.B.2.

EPA considered the relationship between the two provisions and, in the end, concluded that Congress did not intend to make the Agency's authority to minimize adverse environmental impacts under § 316(b) co-extensive with the direction to assure a "balanced, indigenous population of shellfish, fish, and wildlife in and on" the waterbody under § 316(a). Pet. App. 59a, n.27. EPA reasoned that, had Congress intended to compel that result, it would have used parallel language in the two provisions. But this interpretation of § 316(b) does not preclude the Agency from using cost-benefit analysis to decide what is necessary to "minimize adverse environmental impact" in a particular case, taking site-specific factors into account, and the Agency has never suggested it does.

This position is consistent with EPA's long-standing interpretation of § 316(b) and its

relationship to § 316(a). As the Agency's General Counsel explained in 1977:

> Any cooling water intake technology may be imposed under Section 316(b), despite a successful Section 316(a) demonstration, if the cost of the technology is not 'wholly disproportionate' to the environmental gains to be derived from the application of the technology. As a practical matter, though, it would be more difficult for the Agency to show, for example, that the imposition of a $25 million technology under Section 316(b) is not 'wholly disproportionate' to the magnitude of the adverse environmental impact if the discharger has shown under Section 316(a) that the overall impact of a less stringent thermal effluent limitation does not interfere with the protection and propagation of the balanced, indigenous population.

In re Central Hudson, *supra* at 40, 1977 WL 28250 at *9.

EPA's long-standing interpretation harmonizes §§ 316(a) and (b) and is consistent with the plain language of both. It followed this interpretation of the linked provisions in developing the Phase II rule. As this Court has observed repeatedly, a long-standing agency interpretation is

entitled to substantial deference. *See supra* Argument § I.B.

The Second Circuit's reliance on *Russello v. United States*, 464 U.S. 16 (1983), to support its rejection of EPA's interpretation of § 316 is wholly misplaced. Pet. App. 59a n.27. The *Russello* presumption – that the presence of a phrase in one provision and its absence in another reveal Congress's design – is only one indication of meaning. *Kapral v. United States*, 166 F.3d 565, 579 (3d Cir. 1999) (Alito, J., concurring); *United States v. Ressam*, 128 S. Ct. 1858, 1865 (2008) (Breyer, J., dissenting). It grows weaker with each difference in the statutory provisions being examined. *City of Columbus v. Ours Garage & Wrecker Serv.*, 536 U.S. 424, 435-36 (2002).

Here, the obvious difference between the two provisions is that one – § 316(a) – provides for a wholly water quality-based variance from otherwise applicable technology and water-based standards, while § 316(b) requires the use of technology to accomplish a site-specific environmental result. Because the authorization (indeed, the responsibility) to consider water quality is embedded in § 316(b), Congress did not need to provide for a specific water quality-based variance of the type it adopted in § 316(a).

In short, there is no support for any of the rationales offered by the Second Circuit to justify its conclusion that Congress intended to forbid site-specific cost-benefit analysis.

C. The Record Supports EPA's Reading of § 316(b)

To develop the national rule, EPA made a number of assumptions about the extent and impact of the aquatic effects of intake structures at power plants. The Agency understood that some of these were generalizations that might tend to inflate its assessment of the risk posed by impingement and entrainment. The Agency also understood that the amount and type of impingement mortality and entrainment that occurs and the environmental impacts of any losses are strongly influenced by local conditions. As a result, "EPA's comparison of national costs to national benefits may not be applicable to a specific site due to variations in (1) the performance of individual technologies and (2) characteristics of the waterbody in which the intake(s) are located, including resident aquatic biota." Pet. App. 250a (69 Fed. Reg. 41,604).

1. Impingement and Entrainment Vary Widely Based on Site-Specific Conditions

A power plant withdrawing large quantities of cooling water may not impinge many fish if its intake is in an area that is not desirable habitat or where the resident fish do not dwell in the water column. *See, e.g.*, DCN:1-3003-BE at 308 (1974-75 impingement sampling at Big Rock Nuclear Station in Michigan produced only 326 fish weighing 49 pounds total); DCN:1-3021-BE at 207 (1974-75

impingement sampling at Ghent Electric Generation Station recovered only six fish); *see also* Pet. App. 229a-230a, 249a-251a (69 Fed. Reg. 41,599, 41,603-04); UWAG Phase I Comments at 109-12. Similarly, a plant may not entrain many eggs or larvae if the intake is not near a breeding area or if most of the eggs and larvae are not free-floating. Pet. App. 229a-230a (69 Fed. Reg. 41,599).

Impacts vary seasonally as well. For example, eggs and larvae may be present to be entrained during species-specific spawning seasons but not the rest of the year. Pet. App. 293a-294a, 307a (69 Fed. Reg. 41,613, 41,616). As EPA recognized, "because of the location of the intake, the characteristics of a particular waterbody, or the behavioral patterns of the fish or shellfish in that particular waterbody, there may be little or no impingement mortality or entrainment occurring at the site...." Pet. App. 250a-251a (69 Fed. Reg. 41,604).

Equally important, the mere fact that impingement or entrainment occurs does not always signal that the intake has caused "adverse environmental impact." [24]

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[24] As discussed in this subsection, not all impingement or entrainment is harmful, even to the affected individual. Some organisms are intruders which do more harm than good to the ecosystem. EPA declined to distinguish among species for purposes of setting the national standards. However, it recognized the importance of allowing state resource managers, who may find certain species harmful and thus welcome a

(continued...)

First, as EPA recognized, due to the very high natural mortality to which aquatic organisms are subject, many organisms arrive at the intake structure already dead or moribund. *See, e.g.*, Pet. App. 581a-582a (40 C.F.R. § 125.95(b)(7)(ii)) (requiring that verification monitoring plan for assessing technology performance account for naturally moribund fish and shellfish that enter the structure). The record suggests that this phenomenon is not uncommon.[25] Because special procedures are required to gauge even an adult organism's condition prior to impingement (a task that is difficult or impossible for earlier life stages), EPA's national assessment of intake impacts largely assumed that all losses are caused by the intake.[26]

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certain amount of "cropping," to set their own priorities. *See, e.g.*, EPA's Response to Comment 4188, J.A. 355; Pet. App. 269a (69 Fed. Reg. 41,608) (cost-benefit alternative provides flexibility comparable to purely site-specific approach); *See* UWAG Phase I Comments 85. *See also* UWAG Phase II Comments 101-03 (providing support for exclusion of invasive species from protection under § 316(b)).

[25] In one analysis of 40 impingement surveys, 70% of the organisms collected were dead before they were impinged. Cherry *et al.*, Effects of Impingement/Entrainment at the Kanawha River Plant, DCN:1-3007-BE at 6. *See also* Potter, Assessment of the Effects of Impingement and Entrainment on the Fish Community of the New River, Virginia, DCN:1-3056-BE at 20 (March 1978) (93.9% of 842 fish collected were dead prior to impingement).

[26] For the very early life stages subject to entrainment, EPA made an effort to factor in the extremely high natural mortality rates those life stages typically experience by

(continued...)

But EPA knew that requiring application of the technology most capable of reducing impingement and entrainment would do nothing to re-animate organisms already dead or dying from natural causes.

Second, the Agency understood that many organisms survive impingement and entrainment unscathed. That is why EPA developed national standards for "impingement mortality" rather than impingement *per se*. Although EPA chose not to do the same for entrainment, it did allow facilities to gauge entrainment survival if they apply for site-specific limits based on cost-benefit balancing. *See supra* n.16.

2. The Availability, Effectiveness, and Cost of Intake Technologies Vary Widely By Site

The availability, effectiveness, and cost of intake technologies that reduce impingement or entrainment, or improve organism survival, also vary with existing site and facility constraints and the biological and hydrological conditions at the site,

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calculating the number of "equivalent adults" represented by entrainment losses. *See, e.g.*, Pet. App. 171a-172a (69 Fed. Reg. 41,586). EPA assumed, however, that the actual organisms entrained were alive upon arrival and thus would have contributed in some fashion to equivalent adult production but for the intake structure.

as EPA recognized. *See* Pet. App. 247a-252a, 289a-295a (69 Fed. Reg. 41,603-04, 41,612-13). For example, cylindrical wedgewire screens can reduce impingement mortality by 80-95% for fish and shellfish and, if required, reduce entrainment by 60-90% under certain conditions. Pet. App. 245a-246a (69 Fed. Reg. 41,602). However, such screens work best where in-stream flow conditions are sufficient to carry away organisms removed from the screen, so they do not become re-impinged. Pet. App. 529a (40 C.F.R. § 125.99(a)(ii)); *see also* EPA's Response to Comment 979. And barrier nets, which are successful at reducing impingement mortality by 80-90%, are susceptible to damage by strong currents, debris, and icing and thus may be unsuitable for certain sites but very effective at others. EPA, Technical Development Document for the Final Section 316(b) Phase II Existing Facilities Rule (EPA 821-R-04-007) (DCN:6-0004) (Feb. 12, 2004) ("EPA TDD") 4-14.

Even where site conditions allow a technology to reduce impingement and entrainment, it may create other environmental and social problems. For example, large in-stream screens or nets may create hazards to navigation. Pet. App. 447a-449a (69 Fed. Reg. 41,649-50). Enlarging intake structures to reduce velocity may require construction in shoreline habitat. *Id.* As we have already pointed out, changes to the cooling system often create significant adverse side-effects, most notably energy penalties and increased air emissions. Pet App. 256a-261a (69 Fed. Reg. 41,605-06). In some cases, the thermal discharge from the facility provides unique habitat

for an important species. Curtailing that discharge with a closed-cycle system can have disastrous results for the species in question.[27]

As the environmental impacts of intake technologies vary from site to site, so do the costs. *See, e.g.* EPA TDD, 1-1 to 1-13 (cost estimates for retrofitting wedgewire screens at fossil-fueled plants show 36-fold difference in cost depending on site-specific factors); EPA TDD, Table 2-21 and 2-22 (showing 115-fold difference in cost of retrofitting fine mesh traveling screens with fish returns, depending on site-specific factors). The capital, energy, and operating and maintenance costs of retrofitting closed-cycle cooling, which is particularly costly and difficult for existing facilities, is highly dependent on site-specific factors. Pet. App. 256a (69 Fed. Reg. 41,605) (capital costs for cooling towers even for *new* plants would range from about $170,000 to $12.6 million per plant annualized, depending on flow); 68 Fed. Reg. 13,527 (Mar. 19, 2003) (citing DOE study showing site-specificity of retrofit costs). Moreover, EPA was concerned that the small sample of plants it used to estimate retrofit

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[27] *See, e.g.*, Fla. Dept. Industrial Wastewater Comments on Phase II Rule 2 (Aug. 7, 2002), J.A. 262-63 (describing adverse impacts of thermal discharge curtailment on endangered manatees, which seek out thermally enriched waters as habitat); *see also* FPL Comments on the Proposed 316(b) Rule for Existing Sources, Public Comment 1.051 (Aug. 7, 2002) 6.

costs was unlikely to capture the full cost. Pet. App. 259a (69 Fed. Reg. 41,605-06).

In sum, faced with the Herculean task of developing national standards to address the complex, interlocking, and inherently local environmental and technical issues presented by § 316(b), the Agency considered a number of approaches. It chose the approach that offered some measure of uniformity, while also providing to facilities and regulators the safety valve of considering the site-specific factors that drive both the "adverse environmental impact" likely to occur and the availability, performance, and cost of intake technologies for reducing that impact.

CONCLUSION

In the broadest sense, cost-benefit balancing is a fundamental tool of logical decision-making. It allows the decisionmaker to use all the available information to make the most reasonable choice for achieving an objective. Courts, governments, markets, industries, and ordinary people rely on it constantly, whether explicitly or implicitly, to make rational decisions.

Now, for the first time, the Second Circuit has held that cost-benefit analysis is forbidden even where it is consistent with achieving a statutory objective and the statute does not expressly prohibit it. This is folly. The court was wrong to substitute its own highly selective interpretation for EPA's eminently reasonable one.

This Court should hold that EPA's consideration of costs and benefits in deciding what is "best technology available" on a national basis and establishing performance standards based thereon was within its statutory authority. Likewise, this Court should hold that EPA was within its authority in permitting site-specific determinations of "best technology available" when the cost of meeting national standards would be significantly greater than the benefits.

The portions of the Second Circuit's judgment remanding the national performance standards and site-specific cost-benefit provisions of the Phase II Rule (which are described in greater detail in Section IV of the Entergy/PSEG Brief) should be reversed.

Respectfully submitted,

KRISTY A. N. BULLEIT
Counsel of Record
HUNTON & WILLIAMS LLP
1900 K STREET, N.W.
WASHINGTON, DC 20006-1109
(202) 955-1547

Counsel for Petitioner

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UWAG APPENDIX

33 U.S.C. § 1311(g) (Clean Water Act § 301(g)

(g) Modifications for certain nonconventional pollutants

(1) General authority

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F) of this section) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

(2) Requirements for granting modifications

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that—

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

(3) Limitation on authority to apply for subsection (c) modification

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

(4) Procedures for listing additional pollutants

(A) General authority

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for pollutants identified pursuant to section 1314 (a)(4) of this title, toxic pollutants subject to section 1317 (a) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

(B) Requirements for listing

(i) Sufficient information The person petitioning for listing of an additional pollutant under this subsection shall submit to the Administrator sufficient information to make the determinations required by this subparagraph.

(ii) Toxic criteria determination The Administrator shall determine whether or not the pollutant meets the criteria for listing as a toxic pollutant under section 1317 (a) of this title.

(iii) Listing as toxic pollutant If the Administrator determines that the pollutant meets the criteria for listing as a toxic pollutant under section 1317 (a) of this title, the Administrator shall list the

pollutant as a toxic pollutant under section 1317 (a) of this title.

(iv) Nonconventional criteria determination If the Administrator determines that the pollutant does not meet the criteria for listing as a toxic pollutant under such section and determines that adequate test methods and sufficient data are available to make the determinations required by paragraph (2) of this subsection with respect to the pollutant, the Administrator shall add the pollutant to the list of pollutants specified in paragraph (1) of this subsection for which modifications are authorized under this subsection.

(C) Requirements for filing of petitions

A petition for listing of a pollutant under this paragraph—

(i) must be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title;

(ii) may be filed before promulgation of such guideline; and

(iii) may be filed with an application for a modification under paragraph (1)

with respect to the discharge of such pollutant.

(D) Deadline for approval of petition

A decision to add a pollutant to the list of pollutants for which modifications under this subsection are authorized must be made within 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title.

(E) Burden of proof

The burden of proof for making the determinations under subparagraph (B) shall be on the petitioner.

33 U.S.C. § 1371(c) (Clean Water Act § 511(c))

(c) Action of the Administrator deemed major Federal action; construction of the National Environmental Policy Act of 1969

(1) Except for the provision of Federal financial assistance for the purpose of assisting the construction of publicly owned treatment works as authorized by section 1281 of this title, and the issuance of a permit under section 1342 of this title for the discharge of any pollutant by a new source as defined in section 1316 of this title, no action of the Administrator taken pursuant to this chapter shall be deemed a major Federal action

significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (83 Stat. 852) [42 U.S.C. 4321 et.seq.]; and

(2) Nothing in the National Environmental Policy Act of 1969 (83 Stat. 852) shall be deemed to—

(A) authorize any Federal agency authorized to license or permit the conduct of any activity which may result in the discharge of a pollutant into the navigable waters to review any effluent limitation or other requirement established pursuant to this chapter or the adequacy of any certification under section 1341 of this title; or

(B) authorize any such agency to impose, as a condition precedent to the issuance of any license or permit, any effluent limitation other than any such limitation established pursuant to this chapter.

RESPONDENT'S BRIEF

Supreme Court, U.S.
FILED
SEP 29 2008
OFFICE OF THE CLERK

No. 07-588, 07-589 and 07-597

In the Supreme Court of the United States

ENTERGY CORPORATION, PETITIONER
v.
ENVIRONMENTAL PROTECTION AGENCY, ET AL.

PSEG FOSSIL LLC, ET AL., PETITIONERS
v.
RIVERKEEPER, INC., ET AL.

UTILITY WATER ACT GROUP, PETITIONER
v.
RIVERKEEPER, INC., ET AL.

On Writ of Certiorari
to the United States Court of Appeals
for the Second Circuit

BRIEF FOR RESPONDENTS RIVERKEEPER, INC., ET AL.

EDWARD LLOYD
Environmental Law Clinic
Columbia University
School of Law
435 West 116th St.
New York, NY 10027
(212) 854-4291

P. KENT CORRELL
300 Park Ave., 17th Fl.
New York, NY 10022
(212) 475-3070

RICHARD J. LAZARUS *
600 New Jersey Ave., N.W.
Washington, DC 20001
(202) 662-9129

REED W. SUPER
116 John Street
Suite 3100
New York, NY 10038
(212) 791-1881

* Counsel of Record

QUESTION PRESENTED

Whether Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

PARTIES TO THE PROCEEDING

In the United States Court of Appeals for the Second Circuit, the petitioners were Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay – People for Narrangansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, Surfrider Foundation, State of Rhode Island, State of Connecticut, State of Delaware, Commonwealth of Massachusetts, State of New Jersey, State of New York, Appalachian Power Co., Illinois Energy Ass'n, Utility Water Act Group, Entergy Corp., and PSEG Fossil LLC and PSEG Nuclear LLC. The respondents were the United States Environmental Protection Agency (EPA) and Stephen L. Johnson, in his official capacity as Administrator of EPA. Appalachian Power Co. and the Illinois Energy Ass'n were petitioners before the Second Circuit and are not parties in the proceedings now before this Court.

Pursuant to Supreme Court Rules 24.1 and 29.6, there is no change in the corporate disclosure statement previously filed by Riverkeeper, Inc., Natural Resources Defense Council, Waterkeeper Alliance, Soundkeeper, Inc., Scenic Hudson, Inc., Save the Bay – People for Narrangansett Bay, Friends of Casco Bay, American Littoral Society, Delaware Riverkeeper Network, Hackensack Riverkeeper, Inc., New York/New Jersey Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, California Coastkeeper, Columbia Riverkeeper, Conservation Law Foundation, or Surfrider Foundation.

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BRIEF FOR RESPONDENTS RIVERKEEPER, INC., ET AL.

STATEMENT

This Court granted certiorari to consider "whether Section 316(b) of the Clean Water Act authorizes the Environmental Protection Agency to compare costs with benefits in determining the 'best technology available for minimizing adverse environmental impact' at cooling water intake structures." The statutory language of Section 316(b) directly answers that question by denying EPA the authority the Agency claims to compare costs with benefits. The judgment of the court of appeals should be affirmed.

A. Background

1. The Use of Cooling Water in the Production of Power

The federal regulations challenged in this case apply to power plant cooling water intake structures that withdraw more than 50 million gallons of cooling water per day. Water has long served a central role in the production of power because of its remarkable physical and chemical characteristics.

During the nation's early years, water mills exploited the energy potential within water's liquid flow. 1 Louis C. Hunter, *A History of Industrial Power in the United States 1780-1930* 1-3 (1979). With the introduction of the steam engine in the middle of the eighteenth century, however, water became a power source based on its ability to convert from a liquid to a gas and then to cool. 2 Louis C. Hunter, *A History of*

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A steam engine produces power by raising the temperature of liquid water sufficiently high to convert it to a gas and then by using the pressure generated by the gas in a confined space to produce mechanical power – for instance, to drive a piston. The first steam engines did not utilize water's cooling capacity, but as early as 1698, a newly-designed steam engine was able to produce greater power by spraying cooling water to condense the steam back to liquid water – the resulting vacuum generated further pressure capable of producing more power. See 2 Hunter, *A History of Industrial Power, supra*, at 1-2, 5-7, 671; see also Henry C. Meyer, Jr., *Steam Power Plants: Their Design and Construction*, 142-43 (3d ed. 1912). The increased demand by steam engines for water inevitably generated conflicts between competing users of waterways. See *Mason v. Hill*, 110 Eng. Rep. 692 (1833); *Sandusky Portland Cement Co. v. Dixon Pure Ice Co.*, 251 F. 506 (7th Cir. 1918).

The steam engine's design remains basically the same today, whether the heat necessary to convert water from a liquid to a gas is produced by fossil fuel combustion or nuclear fission and whether the power drives a piston or a turbine to produce electricity. See M. M. Samuels, *Power Unleashed: The Story of Electricity and Power*, 222-24 (1943). What has dramatically changed is the physical scale of power plant operations and, accordingly, their environmental impact. Today, a typical 500 megawatt coal-fired power plant uses approximately 12 million gallons of cooling water *per hour*, or approximately 300 million gallons *per day*. For larger power plants, cooling water consumption can be greater than three billion gallons

per day. In 2000, thermoelectric power plants used 136 billion gallons of fresh water per day, which represents about 39 percent of the total withdrawal of fresh water in the United States. See U.S. Department of Energy, *Addressing the Critical Link Between Fossil Energy and Water*, 1-4 (2005). Thermoelectric power is also currently the single largest source of withdrawal of total water (fresh water and saline water) in the nation, accounting for 47 percent of that total. Pet. App. 170a.[1] The power plants covered just by the Phase II rule at issue in this case "withdraw more than 214 billion gallons of cooling water a day from waters of the United States." *Id.* at 169a-170a.

2. Cooling Water Intake Structures and their Adverse Environmental Impact

Because cooling water intake structures withdraw such extraordinarily large amounts of water, their withdrawals necessarily affect the full spectrum of organisms in the aquatic ecosystem at all life stages. Aquatic organisms are drawn into cooling water systems where they are either "impinged" onto components of the intake structure or "entrained" within the cooling water system itself. Pet. App. 170a. Impingement occurs when organisms are trapped against intake screens by the force of the water being withdrawn into the structure. *Id.* at 170a-171a. Entrainment happens when aquatic organisms are instead drawn through the cooling system. Entrained organisms are subject to severe mechanical, thermal, and toxic stresses. *Id.* at 171a.

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[1] Citations to the Pet. App. refer to the appendix filed in No. 07-588.

As EPA has acknowledged, it is impossible to quantify with any precision the nature and extent of the adverse environmental impacts caused by the withdrawal of approximately 80 trillion gallons of water per year by cooling water intake structures. EPA has nonetheless estimated, looking only to fish and shellfish mortality caused by entrainment and impingement, that the cooling water intake structures covered just by the Phase II regulations at issue in this case cause the death of more than 3.4 billion fish and shellfish each year, expressed in terms of "age 1 equivalents."[2] *Id.* at 168a-174a; see National Wildlife Federation Amicus Br. I.A.1.

The harm caused by a cooling water intake structure is most directly related to the amount of water the structure withdraws, which largely turns on the type of cooling system the facility utilizes. There are generally two types of cooling systems: once-through cooling systems and closed-cycle cooling systems (wet or dry). As its name suggests, a once-through system circulates the water through a condenser and then returns the now-heated water to the water body from which it was withdrawn. U.S. DOE, *Addressing the Critical Link, supra*, at 3-4. A wet closed-cycle cooling system uses wet cooling towers, ponds, or lakes to dissipate the heat from the cooling water to the atmosphere. *Id.* A dry cooling system uses air to cool the exhaust steam. *Id.* The water use requirements of these cooling systems vary significantly. On average, a once-through system requires 37.7 gallons of water per kilowatt hour of power produced. A wet closed-cycle

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[2] See Pet. App. 172a ("age 1 equivalents is an accepted method for converting losses of all life stages into individuals of an equivalent age").

cooling system, by contrast, uses only 1.2 gallons per kilowatt hour produced. *Id.*

3. The Clean Water Act[3]

a. The first reported congressional concern regarding the environmental harm from power plants' accelerating use of cooling water was in the 1960s. In 1967, Senator Warren Magnuson warned that "by 1980 thermal power plants throughout the Nation will require an amount of cooling water greatly in excess of the average flow of the mighty Mississippi at St. Louis." 113 Cong. Rec. 30129 (1967). Congress held extensive hearings in 1968 and 1969 on the effects of waste heat produced by industrial facilities, focusing on the adverse environmental effects of thermal discharges, but also considering the impact of cooling water intake.[4] A 1968 White House report described how "the large volumes of water withdrawn in once-through cooling processes" can

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[3] This brief offers an extensive discussion of the legislative background leading up to Section 316(b)'s congressional enactment. None is necessary for this Court's resolution of the question presented, which is answered by the statutory language's plain meaning without any resort to the legislative history. The legislative history is entirely in keeping with that plain meaning (see pp. 47-50, *infra*), and is provided only for the purpose of refuting petitioners' mischaracterizations of it.

[4] See *Thermal Pollution, Hearings before the Subcomm. on Air and Water of the Senate Comm. on Public Works*, 90th Cong., pts 1-4 (1968); *id.* at 1 (statement of Sen. Muskie) ("[b]y the end of the next decade, approximately one-sixth of the total fresh-water runoff in the United States will be required for cooling and condensing purposes."); *id.* at 98-102, 104, 112-13, 137-38, 143 (testimony on intake impact on aquatic organisms); *Environmental Effects of Producing Electric Power, Hearings before the Joint Committee on Atomic Energy*, 91st Cong., pt. 1, 341-45, 375-76 (1969) (intake impact).

have "as much or more effect on aquatic life in a stream than the waste discharges on which control measures are required." See Office of Science and Technology of the Executive Office of the President, *Considerations Affecting Steam Power Plant Site Selection*, 46 (1968).

b. In 1972, "Congress, recognizing that 'the Federal water pollution control program * * * ha[d] been inadequate in every vital aspect * * *,' passed the Federal Water Pollution Control Act Amendments of 1972, Pub. L. 92-500, 86 Stat. 816," now referred to as the Clean Water Act. *Milwaukee v. Illinois*, 451 U.S. 304, 310 (1981), *quoting* S. Rep. No. 92-414, 7 (1971), 2 *Legislative History of the Water Pollution Control Act Amendments of 1972*, 1452 (Committee Print compiled for the Senate Committee on Public Works by the Library of Congress), Ser. No. 93-1 (1973) (hereinafter "2 *Leg. Hist.*"). The 1972 "Amendments were viewed by Congress as a 'total restructuring' and 'complete rewriting' of the existing water pollution legislation." *Id.* at 317, *quoting* House Debate on H.R. 11896, 1 *Leg. Hist.* 350-51, 359-60 (remarks of Reps. Blatnik and Jones).

The single most important regulatory reform achieved by the 1972 Act was the seemingly paradoxical notion that the nation's ambitious water quality goals could best be achieved if they were no longer tied to compliance with water quality standards. Congress concluded that past efforts to maintain such a regulatory link had failed because the science of water ecology was too complex to measure the "tolerable effects" with the precision necessary to have water quality standards serve as the primary touchstone for determining the appropriate level of control. *EPA v. California State Water Resources Control Board*, 426 U.S. 200, 202-03 (1976).

The 1972 Act, accordingly, fundamentally restructured the law to rely in the first instance on the imposition of a series of categorically-determined technology-based standards that did not themselves depend on site-specific showings of impact of particular activities on water quality. First promoted by Senator Howard Baker and then embraced by Senator Edmund Muskie,[5] these technology-based standards were designed to achieve the maximum reduction in activities that degraded water quality, by focusing on the extent to which certain technology was, depending on the type of source or pollutant, "practicable," "achievable," "available" or "demonstrated." See Pub. L. 92-500, §§ 301(b), 304(b), 306, 86 Stat. 844-45, 851, 854-56 (1972). The new Act retained the prior approach of seeking compliance with state water quality standards, but only as a supplement to the controls first imposed by the technology-based standards. See *id.* § 301(b)(1)(C); *EPA v. California State Water Resources Control Board*, 426 U.S. at 205 n.12.

c. Congress accomplished this major reform only after the House and Senate first passed sharply different bills and met 39 times over six months to reach an agreement. Statement of Sen. Muskie, 1 *Leg. Hist.* 161. A central issue splitting the two chambers was the extent to which Congress should delegate to EPA the authority to consider and compare costs with benefits in determining the technology-based standards.

The Senate favored a technology-based approach that did not depend on EPA's assessment of the associated water quality benefits of such control,

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[5] See Paul Milazzo, *Unlikely Environmentalists – Congress and Clean Water, 1945-1972*, 214, 220-21 (2006).

including a comparison of control costs to benefits. The Senate report accompanying its bill left no question why such a fundamental shift was necessary: "the great difficulty associated with establishing reliable and enforceable precise effluent limitations on the basis of a given stream quality. Water quality standards, in addition to their deficiencies in relying on the assimilative capacity of receiving waters, often cannot be translated into effluent limitations * * * because of the imprecision of models for water quality and the effects of effluents in most waters." S. Rep. 92-414, 2 *Leg. Hist.* 1426. "With effluent limits, the Administrator can require the best control technology; he need not search for a precise link between pollution and water quality." *Id.*

The Senate version of the new law required *existing point sources* of pollution to comply with two phases of technology-based controls that would become increasingly stringent over time: "In Phase I, to be implemented by 1976, all industrial pollution sources must apply the best practicable technology" ("BPT") and "[i]n Phase II, to be implemented by 1981, * * * industries will be required to apply, where the goal of no-discharge cannot be attained, the best available technology" ("BAT"). S. Rep. 92-414, 2 *Leg. Hist.* 1426. Although for each, the "costs" of control was a factor to be considered in determining the relevant technology-based standard, whether BPT or BAT, there was no allowance for any weighing by EPA of the costs and benefits, consistent with the Senate's decision to remove any linkage between the technology-based standards and a showing of water quality impacts. By contrast, for *new point sources*, the applicable technology-based standard in the Senate bill did allow for an exemption from the categorically-determined technology-based best

available control technology standard based on facility-specific weighing of costs and benefits, but only for those facilities that became subject to the standard for "new" sources because of a modification of the facilities. S. Rep. 92-414, 2 *Leg. Hist.* 1475, 1477; see S. 2770, § 306(b)(1)(C), 2 *Leg. Hist.* 1626-27.

d. The House and the Administration immediately criticized the Senate for its rejection of water quality-based regulation and its related elimination of cost-benefit analysis from almost all aspects of technology-based standards. The EPA Administrator complained that because the Senate bill "eliminates over a period of time the concept of water quality standards and instead depends completely on effluent limitations based on the best available technology or better. * * * Thus, the social benefit we are all seeking – high quality water – is eliminated from the equation and technology is substituted in its place." *Hearings on H.R. 11896*, 2 *Leg. Hist.* 1183; see *id.* at 1132 (testimony of Russell Train, Chairman, Council on Environmental Quality) (criticizing "an across-the-board treatment requirement unrelated to the benefits to be derived"). The Administration produced a cost-benefit analysis that claimed that the costs of the Senate version were exorbitantly high compared to its benefits. Milazzo, *Unlikely Environmentalists*, *supra*, at 227-28.

The House-passed bill sharply departed from the Senate version on the role of cost-benefit analysis. For determining both BPT and BAT, the House bill expressly instructed EPA to consider "the cost and the economic, social, and environmental impacts of achieving such effluent reduction." H.R. Rep. No. 92-911, 1 *Leg. Hist.* 794; see H.R. 11896, § 304(b)(1)(B) & (b)(2)(B), 1 *Leg. Hist.* 980-81. The House bill also declined to make the Phase II BAT requirement

applicable absent subsequent congressional action. It first required the National Academy of Sciences to complete a cost-benefit analysis. H.R. Rep. No. 92-911, 1 *Leg. Hist.* 789; see H.R. 11896, § 301(b)(2)(A), 1 *Leg. Hist.* 963-64. Finally, the House version provided that technology-based provisions for new sources would not apply to modified sources in the absence of a "reasonable relationship" of costs to benefits. *Id.* at 798.

e. The Conference Committee met over six months before reaching agreement.[6] The two chambers split

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[6] The voluminous materials documenting the committee negotiations on the precise wording of the bill's language, especially regarding technology-based standards and the proper role of cost-benefit analysis, are all available in the National Archives and located in a series of "Cartons" labeled "Accession No. 46-75-003, Senate Public Works Committee, Subcommittee on Environmental Pollution, Federal Water Pollution Legislation Files." Within each box there are "Folders" with topic labels and often smaller individual "Files" with topic labels. Only because the more detailed history documented by the National Archives provides a further layer of historical detail potentially of interest to some members of the Court, this brief includes references to that documentation. See notes 7-8, *infra*. The brief refers to six documents located in four different committee files: (1) a file labeled "316," containing drafts of Section 316, in a Folder labeled "Conference Committee Language" contained in Carton No. 2; (2) a file containing correspondence on "Phase I and Phase II," in a Folder labeled "Conference Committee Memos" in Carton No. 2; (3) files labeled "9/13" and "9/14," containing notes on the individual sessions of the House and Senate conferees held on September 13th and 14th, 1972, in a Folder labeled "House-Senate Conference Committee 1972 Water Pollution Bill," in Carton No. 2; and (4) a file labeled "General," containing internal committee memoranda to Senator Muskie and to the Senate Conferees in a folder labeled "House-Senate Conference Committee 1972 Water Pollution Bill" in Carton No. 2. References to documents within this archival material will hereinafter be referred to by the name of the document, file name and the National Archives (e.g., "*A Possible*

fundamentally on the central policy issue of whether the degree of regulation should be defined, as the Senate preferred, by technology-based standards that did not turn on an assessment of water quality impacts and cost-benefit analysis, or the House version, which did.[7]

In the fall of 1972, the conferees reached agreement on a bill that each chamber passed by overwhelming margins, and then Congress overrode a veto triggered by the President's view that the bill's "unconscionable $24 billion price tag" far outstripped its benefits. Veto

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Basis for Agreement on Thermal Pollution, '316 File' Nat. Arch."). For the Court's convenience, we are filing a motion to lodge copies of the National Archives materials cited.

[7] The internal committee documents in the National Archives show a persistent effort by some House conferees to allow EPA to compare costs and benefits both in the establishment of technology-based standards and in allowing individual facilities to seek water quality variances. And, they also demonstrate an equally persistent effort, mostly by Senate conferees, to resist both efforts on the ground that such provisions would invariably invite back into the regulatory equation the very consideration of water quality impacts they believed would undermine the statute's ability to achieve its goals. See, *e.g.*, *Memorandum from Leon G. Billings [Staff Director] to Senate Conferees, Re: Options to the House Proposal on Title III*, 2 (June 15, 1972) ("Phase I and II File" Nat. Arch.) ("The staff believes that the House proposal which would require the application of new source performance standards to existing sources by 1985 unless social and economic and environmental cost outweighed social, economic and environmental benefits would be disastrous. * * * [T]here is no way to adequately quantify the social and economic and environmental benefits of pollution control in relation to the cost associated with that pollution control."); *id.* at 3 ("The House proposal is directly contrary to the Senate concept in that it would require that * * * no controls could be applied unless there were quantifiable benefits to be achieved. This is nothing more or less than an extension of water quality standards.").

Message, 1 *Leg. Hist.* 137. The new law embraced the technology-based approach favored by the Senate with a two-phase approach for existing industrial point sources of pollution and a separate standard for new sources, but with a few discrete concessions to the House.

The legislation enacted allowed for some "limited cost-benefit analysis" in BPT's determination for Phase I, but not for BAT in Phase II. Statement of Sen. Muskie, 1 *Leg. Hist.* 170. "In assessing the BPT the Administrator is to consider 'the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application.'" *EPA v. National Crushed Stone*, 449 U.S. 64, 70 (1980). But "in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits." *Id.* at 71; see *id.* at 71 n.10.

f. Congressional consideration of Section 316, including Section 316(b)'s provision regarding a technology-based standard applicable to cooling water intake structures, reflects this same legislative debate concerning the extent to which, if at all, Congress should authorize EPA to compare costs and benefits in regulating activities that adversely affect the aquatic environment. The House and the Senate were, at the outset, focusing largely on the impact of *thermal discharges*, until the House introduced the related issue of cooling water intake that had been discussed in the prior legislative hearings.

On the discharge issue, the Senate bill favored subjecting the discharge of heat to the generally applicable technology-based standards for existing and new sources. Statement of Sen. Muskie, 1 *Leg. Hist.* 175. The House bill, however, considered "heat"

appropriate for regulation based on a cost-benefit analysis. The House bill, accordingly, instructed EPA to exempt a thermal discharge from regulation upon a determination by EPA that "the economic and social costs of implementing the regulations at a point source bear no reasonable relationship to the economic and social benefits (including water quality objectives) to be attained." H.R. 11896, § 316(d), 1 *Leg. Hist.* 1043-44. The House also called for consideration of "alternative methods" for control, including "cooling devices," "once-through cooling," and "evaporative cooling towers," and instructed EPA to take into account "their relative social and economic costs and benefits," and "their relative impact on the environment, considering not only water quality but also * * * conservation of natural resources." *Id.* § 316(b).

The House and Senate conferees met over the summer on Section 316 without reaching agreement, but then reached a compromise agreement by drawing a distinction between the regulation of thermal discharges and cooling water intake.[8] Both would be

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[8] The stalemate continued over the summer (see *Memorandum from Leon Billings to Senator Muskie on "Status of the Water Pollution Conference,* 2-3 (July 11, 1972) ("General File" Nat. Arch.)). On September 13th and 14th, the conferees broke the logjam by representatives within each chamber suggesting a water-quality approach for thermal *discharge* and a technology-based approach for cooling water *intake*. Under the House proposal, regulation of thermal discharges would have been based on water quality standards, and "cooling water intake facilities" would be subject to a two-phase technology-based standard approach, with a July 1, 1977, deadline for compliance with "best practicable control technology" and a July 1, 1983 deadline for application of "best available demonstrated technology." See *House Proposal on Thermal Discharges (offered 9/14)*, § 316(e)(1)&(2). ("316 File" Nat. Arch.) Among the Senate conferees, Senator Jennings Randolph

subject to technology-based standards, with "heat" expressly defined as a "pollutant" and thereby triggering the BPT and BAT technology-based standards (see § 502(6), 1 *Leg. Hist.* 73), but a biologically-based variance – expressed in terms of protection of fish populations – would be made available for thermal discharges under Section 316(a). See 86 Stat. 876, 1 *Leg. Hist.* 63. Section 316(b) set forth a distinct statutory approach to cooling water intake. It simply announced a technology-based standard for the express purpose of "minimizing adverse environmental impact" without any allowance for the kind of relaxing of a technology-based standard contemplated by Section 316(a). *Id.*

4. EPA Initial Implementation

a. EPA first promulgated Section 316(b) regulations in 1976. 41 Fed. Reg. 17387 (J.A. 38). The Agency then refuted any claim of authority to compare costs and benefits in determining the "best technology available" ("BTA") required for cooling water intake structures under Section 316(b). Rejecting an industry recommendation, EPA explained not only that "[n]o comparison of monetary costs with the social benefits of minimizing adverse environmental impacts * * * is

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proposed a similarly-bifurcated approach to thermal discharge and cooling water intake, except that it provided that "[t]he design and construction of cooling water intake structures would have to be in accordance with the best available technology for minimizing environmental effects." See *A Possible Basis for Agreement on Thermal Pollution* ("316 File" Nat. Arch.); Notes on 9/13 and 9/14 Conference Meetings ("9/13 File" & "9/14 File" Nat. Arch.) (describing Senator Randolph's proposal at "9/13 File," p. 3). The documents within the relevant files belie the Solicitor General's assumption (Br. 11, 23, 34) that Section 316(b) was a mere "afterthought."

required by the terms of the Act" (*id.* at 17388), but also indicated that the Agency had no discretion to do so, because "[t]he statute *directs* the Agency to insure that enumerated aspects of cooling water intake structures reflect the best technology available for minimizing adverse environmental effects" and, consequently, "the effort *must* be to select the most effective means of minimizing (*i.e.*, 'reducing to the smallest possible amount or degree') those adverse effects." *Id.* (emphases supplied).

b. The Fourth Circuit in *Appalachian Power Co. v. Train*, 566 F.2d 451 (1977) invalidated EPA's Section 316(b) regulations on procedural grounds. After more than 15 years of inaction, EPA entered into a consent decree to promulgate new regulations, which the Agency ultimately accomplished in three specific phases:[9] (1) Phase I for cooling water intake structures at new facilities that withdraw daily at least two million gallons of water; (2) Phase II for intakes at larger existing power plants; and (3) Phase III for structures at new offshore and coastal oil and gas extraction facilities, existing manufacturing facilities, and smaller existing power plants. Pet. App. 6a. In the absence of applicable Section 316(b) regulations in the interim years, cooling water intake standards have been relegated to *ad hoc* determination by individual permit writers – typically state agencies, exercising "best professional judgment" pursuant to 33 U.S.C. § 1342(a)(1)(B). See *Natural Resources Defense Council, Inc. v. EPA*, 863 F.2d 1420, 1424 (9th Cir. 1988).

c. In 2001, EPA promulgated its Phase I

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[9] These "phases" are entirely distinct from the two "phases" Congress contemplated for technology-based standards under Sections 301 and 304. See p. 12, *supra*.

regulations, which were mostly upheld in *Riverkeeper, Inc. v. EPA*, 358 F.3d 174 (2nd Cir. 2004). See 66 Fed. Reg. 65256 (2001). EPA promulgated its Phase II regulations, challenged here, in 2004. See Pet. App. 122a-593a. The Agency promulgated its Phase III regulations in 2006 (see 71 Fed. Reg. 35006), and a challenge to that rulemaking is currently pending. See *ConocoPhillips Co. v. EPA*, No. 06-60662 (5th Cir.).

B. Administrative and Judicial Proceedings Below

1. EPA Phase II Rulemaking

EPA's Phase II Section 316(b) rulemaking applies to cooling water intake structures with a design flow of at least 50 million gallons of water per day at existing power producing facilities subject to Section 301 of the Clean Water Act. Pet. App. 9a-10a (40 C.F.R. § 125.91)). EPA determined that closed-cycle cooling systems were not required and that a covered point source could meet the BTA standard by utilizing any of a "suite of technologies" capable of meeting national technology-based performance standards. *Id.* at 12a. These performance standards required that impingement mortality and entrainment be reduced for all life stages of fish and shellfish within specified numeric ranges (expressed as percentage reductions from a baseline), with some facilities exempted from the entrainment requirement. *Id.* at 12a-14a (40 C.F.R. § 125.94(b)).

The Phase II regulations established several compliance alternatives for achieving these standards. Pet. App. 10a (40 C.F.R. § 125.94(a)). The first included a reduction in flow commensurate with a closed-cycle recirculating system, which would be deemed sufficient to meet both impingement mortality and entrainment performance standards. *Id.* at 12a (§ 125.94(a)(1)(i)).

Another option was "a site-specific compliance alternative" that required a permitting authority to make a site-specific determination of BTA that is "as close as practicable" to national performance standards if a facility demonstrated that its compliance costs would be "significantly greater than the benefits of complying" with the performance standards. See *id.* at 14a (§ 125.94(a)(5)(i)).

2. Lower Court Decision

Both industry petitioners and environmental and state respondents petitioned for review of the EPA Phase II rulemaking, which was heard on direct review by the Second Circuit. The appellate court denied almost all industry challenges[10] and granted relief in response to all respondents' claims.[11] Pet. App. 1a-94a.

First, the court held that EPA had failed to explain adequately the basis of its rulemaking. The "record evidence alone * * * is oblique, complicated, and insufficient to permit us to determine what the EPA relied upon in reaching its conclusion." Pet. App. 35a;

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[10] The court rejected industry challenges to EPA's application of Section 316(b) to existing sources, definition of "adverse environmental impact," assumption of zero entrainment survival, lack of definition of "Great Lakes," and failure to account for the supposedly disproportionate impact on the nuclear industry. None of those rulings is affected by this Court's disposition of this case.

[11] Because the question presented by this case is distinct from most of these rulings in favor of respondents below, a remand to EPA is necessary regardless of the outcome in this case. Lower court rulings include that facilities cannot meet national performance standards based on use of restoration measures, that the ranges within EPA's national performance standards impermissibly allowed facilities capable of meeting higher standards to meet lower standards instead, and that there was inadequate notice of various other aspects of the rule.

see also *id.* at 33a ("difficult to discern from the record how EPA determined that the cost of closed-cycle cooling could not be reasonably borne by the industry").

Second, the court held that "the language of 316(b) itself plainly indicates that facilities must adopt the best technology available and that cost-benefit analysis cannot be justified in light of Congress's directive." Pet. App. 23a-24a (emphasis omitted). The court stressed, however, that EPA could take costs into account. The terms "best available" meant EPA should consider whether the costs of a particular technology could be "reasonably borne" by the industry. *Id.* at 24a. The court also made clear that if more than one technology achieves "essentially the same results," EPA can "appropriately choose the cheaper technology" on cost-effectiveness grounds. *Id.* at 27a.

On this same ground, the court faulted both EPA's rejection of the closed-cycle cooling option for national performance standards and its allowance of a site-specific cost-benefit compliance variance option. With regard to the former, the court ruled that it could not discern whether EPA had improperly relied on a cost-benefit comparison because, as previously described, the Agency had failed to articulate the basis of its decision. The court, accordingly, remanded to EPA for an adequate explanation of its decision. *Id.* at 32a, 36a-37a.

The court, however, squarely concluded that the cost-benefit variance option was invalid: "The Agency is * * * precluded from undertaking such cost benefit analysis because the BTA standard represents Congress's conclusion that the costs imposed on industry in adopting the best cooling water intake structure available * * * are worth the benefits in reducing adverse environmental impacts." Pet. App.

57a-58a. The court further noted how the site-specific cost-benefit compliance option directly contravened Congress's policy choice in the Act not to relax technology-based standards on the basis of local water quality. *Id.* at 58a.

SUMMARY OF ARGUMENT

The short answer to the question posed by this Court in granting certiorari is that Congress did not authorize EPA in Section 316(b) of the Clean Water Act to compare costs and benefits in determining the "best technology available for minimizing adverse environmental impact" of cooling water intake structures. Congress instead exercised its prerogative to answer that essential policy question itself by prescribing the extent to which both costs should be incurred and benefits should be achieved. And, Congress's deliberate decision to adopt a technology-based performance standard approach that precludes EPA from striking a different cost-benefit balance is entirely in keeping with the legislature's highly successful decision in 1972 to free the safeguarding of the nation's waters from the scientific and economic uncertainties inherent in the application of water quality standards.

A. To find the answer to the question posed by this Court, one need look no further than the plain meaning of Section 316(b)'s language. The statute provides that EPA must develop standards governing the design, location, construction, and capacity of cooling water intake structures that reflect the "best technology available for minimizing adverse environmental impact." Congress, accordingly, made clear the two defining touchstones for EPA's determination of this particular "best technology" standard. The technology

must be "available" and it must be the best of those available technologies for "minimizing adverse environmental impact." The former governs the extent to which costs can and must be tolerated, and the latter establishes the extent to which environmental benefits can and must be achieved consistent with those costs.

What is not left for EPA is any authority to reconsider how those costs and benefits should be weighed in comparison to each other. EPA can no more determine that the costs of available technology do not warrant the benefits of minimizing the adverse environmental impact than it can conclude that the benefits warrant a cost higher than that supported by available technology. Congress took both those inquiries off the table.

B. The Clean Water Act's overall structure confirms Section 316(b)'s plain meaning. Throughout the Act, Congress used precise and particular language to make clear to what extent costs and benefits could be considered by EPA in the establishment of various technology-based performance standards and when, in carefully limited contexts, any independent comparison by EPA of the relation of those costs to pollution control benefits would be permissible. Within that broader statutory context, Congress's contrasting failure to provide EPA with any such cost-benefit comparison authority in Section 316(b) is dispositive of the question presented in this case.

C. In the face of such clear statutory meaning, the legislative history need not be consulted. But, not surprisingly, that history fully corroborates the statutory text's plain meaning. What that history reveals is that the single most important policy issue facing Congress and the White House in 1972 was the

extent to which Congress should strike the cost-benefit balance itself or instead delegate such authority to EPA in the establishment of water pollution controls capable of meeting the nation's ambitious goals for protecting water quality. The Senate and House embraced sharply contrasting approaches and reached a compromise bill only after more than six months of conference committee deliberations on the precise statutory wording on the role of costs, benefits, and their comparison. The final bill repeatedly eliminated language in different sections that would have authorized EPA to engage in the kinds of cost-benefit comparisons petitioners here advocate.

Indeed, Section 316 itself expresses a clear congressional compromise directly relevant to the resolution of this case, based on the different policy approaches that Congress embraced in addressing the regulation of thermal discharges in Section 316(a) and cooling water intake in Section 316(b). For the former, Congress rejected a House proposal to authorize EPA to engage in cost-benefit analysis, but Congress did allow EPA to excuse compliance with a technology-based standard upon demonstration of achievement of a prescribed biologically-based standard. But for the latter, Congress required a strict technology-based approach under which Congress itself answered the question of how costs and benefits should be compared: the adverse environmental impact must be "minimized" by use of the "best technology available."

D. What EPA plainly cannot now do is write back into the statute the very wide-ranging authority to compare costs and benefits that Congress purposely denied EPA. Nor can this Court second-guess that legislative policy determination. The judgment of the court of appeals should be affirmed.

ARGUMENT

SECTION 316(b) OF THE CLEAN WATER ACT DOES NOT AUTHORIZE EPA TO DETERMINE THE "BEST TECHNOLOGY AVAILABLE FOR MINIMIZING ADVERSE ENVIRONMENTAL IMPACT" BASED ON THE AGENCY'S OWN COMPARISON OF THE COSTS AND BENEFITS OF POSSIBLE TECHNOLOGIES

We note at the outset that industry petitioners and the Solicitor General fundamentally disagree on the proper analytic framework for resolving the question presented.[12] Industry petitioners believe that Section 316(b)'s meaning is plain and unambiguously authorizes EPA to compare costs and benefits in establishing BTA. See Entergy Br. 31-32; UWAG Br. 31. The Solicitor General, however, contends that the statutory language "does not speak to the question presented" but is instead ambiguous. U.S. Brief 15. The Solicitor General nonetheless argues that EPA's view of Section 316(b) should be upheld as a reasonable interpretation of ambiguous statutory language. *Id.* at 15-23.

The Solicitor General is correct that the statute's plain meaning does not support industry petitioners' reading of Section 316(b). But the Solicitor General is wrong in contending that the language is ambiguous and can be reasonably construed to allow EPA authority to compare costs and benefits. The plain meaning, as

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[12] Because the Solicitor General on behalf of respondent EPA is aligned with industry petitioners on the question before this Court, general references in this brief to the "petitioners" will refer both to the Solicitor General and industry petitioners. Otherwise, these parties will be referred to separately as the "Solicitor General" and "industry petitioners."

evidenced by the language Congress used in Section 316(b), the statutory structure and purpose, and the legislative history, denies EPA any such authority, and the relevant statutory language cannot be reasonably construed to support the Solicitor General's position.

A. The Plain Meaning of Section 316(b) Makes Clear that Comparing Costs and Benefits Is Outside the Scope of EPA's Authority in Determining the "Best Technology Available for Minimizing Adverse Environmental Impact" of Cooling Water Intake Structures

1. Petitioners strive mightily to avoid the plain meaning of the words Congress actually wrote in Section 316(b) by seizing on a series of "sometimes" (U.S. Br. 16) meanings of the statutory language derived not from the primary, secondary, or even tertiary definitions of the relevant terms but from the octonary ones. They accordingly concoct an extraordinary reading of Section 316(b) that is boundless in its delegation of lawmaking authority to EPA:

> [T]he '*best* technology available for minimizing adverse environmental impact' may be the most suitable or desirable technology available for reducing such impact, to whatever extent the decisionmaker believes appropriate in light of competing values.

Entergy Br. 36.

"Best" is therefore stripped out of its statutory context to allow EPA to select the technology it prefers based on whatever factors it deems appropriate. See Entergy Br. 33; U.S. Br. 15-16. The statutory requirement that the technology be best "for minimizing

adverse environmental impact" is completely undone by the claim that the word "for" allows EPA to decide whether a particular technology is "suitable" or "appropriate" based on whichever factors it deems proper, wholly apart from the statutory requirement that adverse environmental impacts be "minimiz[ed]" by available technology. See U.S. Br. 16. And, finally, the "minimizing" standard itself is transformed into no more than a "reduction" aspiration that EPA is permitted to pursue while simultaneously pursuing other competing values of its choice. See U.S. Br. 17-18; Entergy Br. 34-35.

Contrary to petitioners' proffer, however, the role of a court in construing statutory language is not to determine its *strained* meaning, but its *plain* meaning. While discernment of the former might call for a journey into rarefied and unlikely uses of language, the latter is much simpler and therefore more judicial. It looks to the primary and ordinary meaning of the language Congress used in its context. Here, moreover, the ordinary meaning of the language at issue is wholly consistent with the primary definitions of all the relevant terms. Section 316(b) means exactly what it says.

a. First, the word "best" in no manner authorizes EPA to engage in wide-ranging cost-benefit analysis. The primary, ordinary meaning of "best" when used, as in Section 316(b), as an adjective is "surpassing all others in excellence." *The American Heritage Dictionary of the English Language* 173 (4th ed. 2000); see *Webster's Third New International Dictionary* 208 (1971) ("excelling or surpassing all others of its kind"); 2 *The Oxford English Dictionary* 139 (2d ed. 1989).

If, of course, Section 316(b) provided only that EPA

should determine the "best technology," without more, then petitioners might reasonably argue that Congress had delegated to EPA authority to determine what the technology should be "best" at accomplishing. But Section 316(b) does no such thing. The statute expressly dictates precisely what the technology must be best "for": "minimizing adverse environmental impact."

b. Here too, the meaning of "for" is clear and we need look no further than its primary meaning: "used to indicate the object, aim, or purpose of an action or activity." *The American Heritage Dictionary*, *supra*, at 686. The Solicitor General's desperate seizure of an eighth meaning in support of its claim that the word "for" instead confers on EPA broad discretion to decide whether technology is "suitable" or "appropriate" is self-refuting. See *The American Heritage Dictionary*, *supra*, at 686 (8th definition); 6 *The Oxford English Dictionary*, *supra*, at 24 (13th definition); Edwin B. Williams et al. eds., *The Scribner-Bantam English Dictionary* 356 (1977) ("appropriate" listed as the 18th definition). And, in all events, the statutory language prescribes precisely what the technology must be suitable for: minimizing adverse environmental impact.

c. Nor is there any more merit in petitioners' contention that the word "minimizing" merely calls for EPA "to reduce" based on the Agency's own balancing of the value of such reduction compared to other competing values. As EPA originally recognized in 1976 (see 41 Fed. Reg. 17388 (J.A. 41)), the ordinary definition of "minimize" in its statutory context is "to reduce to the smallest possible amount, extent, size, or degree" and not simply "to reduce." *The American Heritage Dictionary*, *supra*, at 1119; 9 *The Oxford English Dictionary*, *supra*, at 815; *Webster's Third New International Dictionary*, *supra*, at 1438.

Even more fundamentally, the plain meaning of "minimizing" does not contemplate a balance at all, let alone a cost-benefit comparison. The purpose of a cost-benefit balance is not to minimize adverse environmental impact, but to determine the permissible environmental impact based on the wholly different policy premise that the cost of reduction should not be greater than the corresponding benefits. A "minimizing" standard permits no such comparison.

Nor, of course, does the "minimizing" requirement mandate that one must reduce at all costs. Where, as with Section 316(b), the statute further provides that the technology must be "available," that separate requirement ensures that costs are considered in determining whether the technology is available. But, consideration of costs is a far cry from a cost-benefit comparison.[13]

d. There is, to be sure, some potential ambiguity in terms of what the word "available" means – in particular, whether it extends beyond physically available to include economically available. See *The American Heritage Dictionary*, *supra*, at 123 ("present and ready for use; at hand; accessible"); *Webster's Third New International Dictionary*, *supra*, at 150 ("accessible or may be obtained"). The Second Circuit held that the term "available" allows EPA to consider costs in determining whether a particular technology is feasible for a particular category of facilities. This has long been

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[13] Petitioners repeatedly conflate the two, suggesting that the issue here is whether EPA can consider costs under Section 316(b) and further suggesting environmental respondents contend EPA cannot do so. We make no such claim, and that is not the issue before the Court, which is limited to EPA's authority to undertake cost-benefit comparisons.

EPA's view, and we do not dispute that threshold proposition. But permitting EPA to consider economic feasibility in determining whether a given technology is "available" on a categorical basis is wholly different from permitting the Agency, contrary to the statute's plain terms, to decide that the costs of such technology, while economically feasible for an industry, do not warrant "minimizing adverse environmental impact."

2. The only limitation on the extent of benefits to be achieved, therefore, is the cost of available technology. The statute leaves no room for EPA to conclude that those benefits are not worth the costs of available technology. Nor does the statutory language, conversely, authorize EPA to conclude that the benefits to be obtained warrant expenditures even higher than those called for by available technology. Both those policy inquiries are outside the bounds of congressionally delegated lawmaking authority under Section 316(b).

The Solicitor General's contrary argument rests on a false syllogism. He argues that because Congress authorized EPA to consider costs and to consider benefits, the legislature must be deemed to have authorized the Agency to compare the two. See U.S. Br. 30. But that is precisely what Congress did not do. And, deliberately so.

Congress instructed EPA to consider the costs in order to ensure "availability." And the legislature likewise instructed the Agency to consider the benefits in order to ensure that environmental impact was minimized. But Congress did not permit EPA to second-guess the legislative judgment that environmental impact must be minimized with available technology by authorizing the Agency to weigh the benefits of the

former against the costs of the latter. "Congress itself defined the basic relationship between costs and benefits * * *" (*American Textile Manufacturers Institute, Inc. v. Donovan*, 452 U.S. 490, 509 (1981)) and did not leave it to EPA to decide what value to assign to these competing interests. *Cf. Dept. of Revenue, Kentucky v. Davis*, 128 S. Ct. 1801, 1821 (2008) (Scalia, J., concurring in part) ("Of course you cannot decide which interest 'outweighs' the other without deciding which interest is more important to you.").

3. Petitioners dangle the usual parade of absurd results they claim will result from reading Section 316(b) based on its plain meaning. None has credence. Although Section 316(b)'s plain meaning defeats petitioners' claim that EPA can compare costs and benefits in determining BTA, EPA retains discretion to administer Section 316(b) in a manner that is both consistent with congressional intent and capable of avoiding petitioners' proffered horribles.

a. For example, Section 316(b)'s denial of any authority to EPA to compare costs and benefits in determining BTA does not mean that EPA lacks any discretion in determining which "adverse environmental impact" must be minimized. Many of petitioners' proposed absurdities are rooted in the notion that EPA is authorized to minimize only entrainment and impingement (which EPA found to be the "primary, harmful environmental effects" that specific technologies can reduce (Pet. App. 234a)), and EPA can give no regard to other kinds of possible adverse environmental impacts related to the location, design, construction, and capacity of cooling water intake structures. Nothing in the plain meaning of Section 316(b), however, compels such an illogical result. Indeed, the Second Circuit acknowledged EPA's

authority to consider also energy efficiency and other environmental impacts. See *Id.* at 26a-27a n.12.[14]

b. Nor is there any merit to the absurd result most often repeated by petitioners and their amici: the specter of industry paying billions of dollars to save one fish (or trillions to save one hapless individual plankton). Although the meaning of "minimizing" is plainly not merely to reduce, it is also just as plainly not so constricted as to require EPA to require industry petitioners to spend billions to save one more fish or plankton. Certainly nothing in the plain meaning of the terms "minimizing adverse environmental impact" compels EPA to establish its BTA standards as precise single-number limitations without any flexibility or margin of error. Just as in other legal contexts, there can be *de minimis* differences. And, the Agency has some discretion (albeit not boundless) to determine that further differences in reduction would be so minor as to be unnecessary for compliance with the minimizing requirement. Petitioner UWAG acknowledges this critical point: "Minimizing adverse environmental impact" is "indisputably broad enough to authorize EPA * * * to decide at what point [impacts] have been 'minimized.'" UWAG Br. 45. We agree.

Hence, if the reduction in adverse environmental impact to be gained from an "enormously expensive" technology would be without "any meaningful environmental consequence" (Entergy Br. 50), with "no

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[14] The full range of "adverse environmental impacts" EPA can consider and the weight each is assigned are not before the Court because they present questions distinct from EPA's authority to compare costs and benefits. Prudence supports deferral of their resolution to a case where, unlike here, they are squarely and necessarily presented.

corresponding environmental benefit" (API Amicus Br. 4), or "identical" to much less expensive measures (American Chemistry Council Amicus Br. 8), Section 316(b) would not compel adoption of the more expensive technology because impacts will have already been minimized by the less expensive technology.

It would not, for this same reason, require a facility that withdraws cooling water from a water body with no aquatic organisms at all – a completely implausible scenario – to implement expensive controls to meet BTA. See Entergy Br. 50. Section 316(b) does not, after all, require EPA to order that a certain technology be used, but permits the Agency instead to establish performance standards that reflect the use of available technology. In the Phase II rule, EPA did just that, expressing the performance standards as percentage ranges for the reduction of impingement mortality and entrainment. If a water body has no aquatic life and therefore a facility has no adverse environmental impact, then it should be able to meet such a performance-based standard without the need for the expensive controls that would be necessary for facilities in other areas. In that (unlikely) scenario, run-of-the-mill technology would protect exactly the same number of fish (and therefore have the same environmental impact) as state-of-the-art technology, and satisfy the environmental performance standard.[15]

In other ways, EPA possesses discretion to announce a standard that satisfies the minimization of

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[15] But, of course, if the intake structure's past operations are the reason for the current lack of aquatic organisms, which would return in significant amounts upon intake reduction, then one could not posit that the continued withdrawal of large volumes of water is having no "adverse environmental impact."

adverse environmental impact requirement without adopting a one-size-fits-all rule. As the court below explained, in doing so EPA retains discretion to decide that the minimization requirement does not mandate some precise numerical reduction ("identically effective") but can be satisfied by a reduction within a prescribed range or, presumably, by not harming more than a prescribed amount. Pet. App. 28a. Cost-benefit comparison authority is not necessary to achieve this sensible end.[16]

c. Finally, equally unavailing are the absurd hypotheticals that petitioners advance based on the supposition that EPA is always required to make BTA determinations on the broadest categorical basis conceivable. Thus, petitioners claim that our suggested reading of Section 316(b)'s terms means that EPA will be forced to ignore any and all differences among facilities and their locations. See UWAG Br. 43-50;

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[16] That is why the court did not rule below (Pet. App. 38a-44a), nor did we argue, that EPA was precluded from using any ranges in its BTA national performance standards describing the reduction of adverse environmental impact to be achieved. The problem with EPA's ranges in its Phase II rulemaking was not the mere fact that they were ranges, but that the rule allowed facilities fully capable of achieving performance near the upper end of the range to choose technology to meet only the lower end. *Id.* at 43a. For this same reason, moreover, regardless of the Court's disposition of the question presented in this case, the Court should reject the claim of the Solicitor General (Br. 39 n.3) and Entergy (Br. 58-59) that this Court should also reverse the lower court's ruling on the validity of EPA's ranges. The Second Circuit's invalidation of those ranges rested on a legal ground distinct from the cost-benefit question now before the Court, petitioners chose not to petition on that distinct issue, and they should not be allowed now to "smuggle additional questions into a case before [the Court] after the grant of certiorari." *Norfolk Southern Railway Co. v. Sorrell*, 127 S. Ct. 799, 805 (2007).

Nuclear Energy Institute Amicus Br. 22-25; Nebraska, et al. Amicus Br 8-10.

Petitioners and their amici are confusing distinct issues and trying to inject a legal issue into the case not in fact presented. Whether EPA can compare costs and benefits in determining BTA and whether EPA can determine BTA based on site-specific, narrow, or broad categorical bases present different legal issues.[17] We do not deny, moreover, that the language of Section 316(b), focusing on features such as "location, design, construction, and capacity," naturally lends itself to tailored agency regulation based on less broad categories. And, we did not challenge in this case several aspects of the Phase II rule that drew distinctions based on considerations such as location. See, *e.g.*, 40 C.F.R. § 125.94(b)(2)(ii)(A) (2007) ("Your facility uses cooling water withdrawn from a tidal river,

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[17] Industry petitioners and their amici insist that the only sensible approach is site-specific, not categorical, determinations of BTA performance standards. Entergy Br. 46-48; UWAG Br. 7-10,45-57; Nuclear Energy Institute Amicus Br. 4, 22-25; Nebraska, et al. Amicus Br. 8-10. The sole question presented in this case, however, is whether EPA can compare costs and benefits in setting BTA standards under Section 316(b), and the answer to that question does not depend on whether EPA is making its BTA determination on a categorical (whether broadly or narrowly drawn) or site-specific basis. The extent of EPA's discretionary authority to make determinations on site-specific grounds or on a narrow rather than broad categorical basis is an entirely distinct issue (see *Chemical Manufacturers Ass'n v. NRDC*, 470 U.S. 116, 131 (1985); *E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 126-129 (1977)) and, in the context of Section 316(b), is at issue now in the Fifth Circuit's review of EPA's Phase III regulations. See *ConocoPhillips Co., et al. v. EPA*, No. 06-60662 (5th Cir.). Here again, industry petitioners should not be allowed to inject new questions not fairly presented by the Court's grant of review. See note 16, *supra*.

estuary, ocean, or one of the Great Lakes * * *") (Pet. App. 560a); *Id.* § 125.94(b)(2)(ii)(B) ("Your facility uses cooling water withdrawn from a freshwater river or stream * * *") (Pet. App. 560a).

Of course, as always, EPA's discretion here is not boundless, because otherwise EPA could too easily subvert the technology-forcing aspect of the BTA standard. But that limit's outer bounds are not implicated by this case. For the purposes of this case, it should be sufficient to note that none of the arguments we present as to Section 316(b)'s plain meaning on the question in fact presented in this case compels the crabbed reading of EPA's authority upon which petitioners' projected absurdities depend.

In sum, there is nothing absurd about applying Section 316(b) according to its plain terms. Section 316(b) may well be Herculean in its ambition, but there is nothing "Sisyphean" in the tasks it assigns. Entergy Br. 52.

B. The Statutory Structure and Context Confirm Section 316(b)'s Plain Meaning

The Clean Water Act's statutory structure and context confirm Section 316(b)'s plain meaning by underscoring the deliberate and limited way Congress chose to authorize EPA to relate costs to benefits in the establishing of environmental protection standards under the Act. "Where Congress includes particular language in one section of a statute but omits it in another * * *, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion." *Keene Corp. v. U.S.*, 508 U.S. 200, 208 (1993), *quoting Russello v. U.S.*, 464 U.S. 15, 23 (1983); see *Allison Engine v. U.S. ex rel. Saunders*, 128 S. Ct. 2123, 2129 (2008).

When Congress passed the Clean Water Act in 1972, it displayed a striking reluctance to authorize EPA to base its determination of environmental performance standards on a comparison of costs and benefits. As previously described (see pp. 6-8, *supra*), Congress deliberately severed the determination of those performance standards from a showing of water quality impacts because of the tremendous scientific and economic uncertainties associated with measuring and assessing those impacts. The Act mandated that EPA promulgate a series of demanding requirements, yet expressly authorized EPA to compare costs and benefits in determining the degree of controls to be imposed in only two extremely limited circumstances.

1. First, Congress authorized EPA to compare costs and benefits in the promulgation of one technology-based effluent limitation. Section 304(b)(1)(B) provided that among the factors that EPA shall consider in determining BPT is the "total cost of application of technology in relation to the effluent reduction benefits to be achieved * * *." 33 U.S.C. § 1314(b)(1)(B). The only other instance in 1972 when Congress expressly called for a direct cost-benefit comparison was in providing for an exemption from the application of water quality based effluent limitations that are more stringent than technology-based effluent limitations under Section 302. See Pub. L. 92-500, § 302, 86 Stat. 846 (1972) (subsequently amended). Under that provision, EPA cannot apply any such more stringent standard to a person who demonstrates that "there is no reasonable relationship between the economic and social costs and the benefits to be obtained * * *." *Id.* § 302(b)(2). Neither of these examples advances petitioners' cause.

a. In 1972, when Congress created the BPT

standard, Congress made clear its intent to phase BPT out and replace it no later than 1983 with a different technology-based standard, BAT, that was designed to be more stringent than BPT and lacked any comparable allowance for EPA to relate costs and benefits in its determination. Indeed, this Court has noted the contrast between the statutory language used for BPT and BAT, the absence of any cost-benefit language for BAT, and Congress's obvious desire not to authorize EPA to engage in such a comparison in determining BAT. See *Crushed Stone*, 449 U.S. at 71 ("in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits").

Petitioners and their amici ignore the clear import of the congressional decision to provide for limited cost-benefit analysis in determining BPT for a few years and to eliminate any such analysis in BAT's determination by asserting that the only difference between BPT and BAT is that the Agency is *required* to engage in limited cost-benefit analysis for the former and *permitted* to do so for the latter. See U.S. Br. 21, 24; Entergy Br. 39-40; UWAG Br. 35-36; ACC Amicus Br. 22-23. Their primary textual support for this extraordinary claim is the inclusion in Section 304(b)(2)(B), which lists the factors EPA is to consider in determining BAT, of a final clause referring to "such other factors as the Administrator deems appropriate." 33 U.S.C. § 1314(b)(2)(B).

That clause cannot, however, be reasonably construed to completely upend the selective and deliberate manner in which Congress had otherwise carefully prescribed the precise extent to which costs and benefits could be considered, and when, if ever, the Agency was empowered to compare one to the other. There is not even a hint of support in the text or

legislative history of the clause for petitioners' radical notion that the only policy dispute separating the House and Senate was whether EPA would be *required* to engage in cost-benefit analysis, including assessment of water quality impacts, rather than *authorized* to do so.[18]

Just the opposite is true. As this Court has previously noted, the legislative history leaves no question that Congress intended for BAT to be more stringent than BPT, and the absence of authority to engage in cost-benefit analysis consideration in determining BAT was a major basis for that intended difference. The Court described in *Crushed Stone* how the statute sets forth "[s]imilar directions" for the determination of BPT and BAT in Sections 304(b)(1)(B) and 304(b)(2)(B) with the single exception that "in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits." 449 U.S. at 71; see 1 *Leg. Hist.* 170 (statement of Senator Muskie) ("In making the determination of 'best available' for a category or class, the Administrator is expected to apply the same principles involved in making the determination of 'best practicable' (outlined above) *except as to cost-benefit analysis.*") (emphasis supplied).

In light of the contrasting language and the clear congressional purpose to ensure that BAT was "more stringent" than the "more modest" BPT (*Chemical Manufacturers Ass'n*, 470 U.S. at 118; *Crushed Stone*, 449 U.S. at 75 n.14), it is beyond any notion of plausibility to construe the final clause in Section

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[18] The difference between petitioners' notion of mandate versus permission is also likely illusory. If, as petitioners contend (Entergy Br. 31), EPA is permitted to compare costs and benefits, no doubt industry petitioners would also argue that EPA would be acting arbitrarily and capriciously by not doing so.

304(b)(2)(B) as, in effect, permitting EPA to inject back into the BAT determination any factor of its choosing, including presumably cost-benefit analysis even more forgiving than that provided for in Section 304(b)(1)(B) for BPT.[19] "Congress * * * does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not, one might say, hide elephants in mouseholes." *Whitman v. American Trucking Ass'ns*, 531 U.S. 457, 468 (2001); *Gonzalez v. Oregon*, 546 U.S. 243, 274 (2006). It is significant in this regard that the language of this final clause was not added during the lengthy Senate and House conference discussions, but was included in the original Senate bill, which eschewed providing EPA with the kind of open-ended authority petitioners nonetheless claim here. See S. 2770 §§ 304(b)(1)(B) & 304(b)(2)(B), 2 *Leg. Hist.* 1615 ("and such other factors as the Administrator deems appropriate").[20]

b. Section 302 is likewise unavailing to petitioners. It requires EPA to undertake a cost-benefit comparison, but not for the purpose of relaxing compliance with a technology-based standard, let alone for determining such a standard. See Pub. L. 92-500, § 302, 86 Stat. 846. Instead, costs and benefits are compared under Section 302 only for the very different purpose of relaxing application of a *water quality standard* that is

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[19] Of course, whatever its meaning, in no event is the language of Section 304(b)(2)(B) part of Section 316(b). The Solicitor General is correct that "[t]he only direct consequence of the cross-reference [in Section 316(b) to Sections 301 and 306] is a procedural one," indicating which standards must require BTA for cooling water intake structures. U.S. Br. 18-19.

[20] For a further refutation of petitioners' claim on this issue, see Environmental Law Professors Amicus Br. II.B; Environment America Amicus Br.

more stringent than a technology-based standard if there is "no reasonable relationship" of costs to benefits. § 302(b)((2). Such a differently-directed provision provides no support for petitioners' suggestion that Congress intended to confer authority on EPA in Section 316(b) to compare costs and benefits in determining BTA.[21]

c. Nor are petitioners supported by the two instances in which Congress in 1972 authorized EPA to take water quality impact into account as a possible basis for relaxing a technology-based standard. The first allows for a modification of BAT for individual sources for which compliance cost is particularly onerous so long as the source demonstrates further reasonable progress toward discharge elimination. See 33 U.S.C. § 1311(c). The second, Section 316(a), applies to thermal discharges and allows for an exemption from a technology-based effluent limitation upon a showing that its application is not necessary to meet statutorily-described fish population objectives. Neither of these narrowly-drawn provisions, however, contemplates EPA's undertaking a cost-benefit comparison or otherwise authorizes EPA to determine how the cost-benefit balance should be struck. In each, Congress declared how the balance should be struck. Both accordingly provide further reason for believing that

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[21] Indeed, a parenthetical within Section 302 made clear that Congress assumed that technology-based standards were not based on cost-benefit comparisons. The parenthetical provides that the lack of a reasonable cost-benefit relationship is grounds for relaxing the water-quality-based effluent limitation "whether or not such technology * * * [is] available," further underscoring Congress's belief that a technology could be "available" even absent a reasonable relationship between costs and benefits. Pub. L. 92-500, § 302(b)(2).

Congress did not intend to provide EPA with sweeping authority to engage in cost-benefit comparisons in the absence of express legislative authorization. Perhaps that is why the Solicitor General fails even to acknowledge Section 316(a)'s existence in his brief.

2. Petitioners and their amici also mistakenly rely on a host of other Clean Water Act provisions in an effort to buttress their argument that Congress intended, with statutory silence, to authorize EPA to compare costs and benefits in determining BTA. Hence, they point out the Act also provides for :

- A technology-based standard for conventional pollutants that, like BPT, allows for some consideration of the relationship of costs and benefits (33 U.S.C. § 1314(b)(4)(B)); see U.S. Br. 20; Entergy Br. 39; ACC Amicus Br. 19); and
- A series of variances for:
  - Some pollutants to allow their control to be reduced from BAT to BPT (33 U.S.C. § 1311(g); see U.S. Br. 21; UWAG Br. 47; Entergy Br. 43-44);
  - Some kinds of discharges into deep waters or marine waters (33 U.S.C. § 1311(h)&(m); see Entergy Br. 36); and
  - Some discharges of toxic pollutants subject to BAT standards (33 U.S.C. § 1311(n); see Entergy Br. 44-45).

None of these provisions, however, aids petitioners' claim on the issue presented. First, Congress added each of these provisions long after 1972 and the

question in this case is what Congress intended *in 1972*, when it enacted Section 316(b), and not in later years when it changed other provisions of the Clean Water Act unrelated to Section 316(b). No less important, each of these provisions demonstrates that Congress continued after 1972 to take extreme care and to act with great precision in deciding when to authorize EPA to compare costs and benefits either in establishing environmental performance standards or excusing facilities from compliance with such standards.

For instance, the reason Congress decided to create the BCT standard was that, contrary to petitioners' submission here, Congress understood that the BAT standard is "not subject to any test of cost in relation to effluent reduction benefits or any form of cost/benefit analysis" and that "in establishing limitations for conventional pollutants * * * the best available technology may not be the most appropriate technology in terms of the relationship of the cost of achieving a particular level of reduction and the amount of reduction actually achieved." 3 *Legislative History of the Clean Water Act of 1977 – A Continuation of the Legislative History of the Federal Water Pollution Control Act Amendments of 1972*, 427 (Committee Print compiled for the Senate Committee on Environment and Public Works by the Library of Congress), Ser. No. 95-14 (1975) (hereinafter " 3 *Leg. Hist.*") (statement of Senate Manager Senator Muskie). For this reason, and for conventional pollutants only, Congress amended the Act to include the same kind of limited cost-benefit analysis already available in BPT as part of the basis for determining BCT: to ensure that costs for one narrow class of pollutants did not increase "beyond the 'knee of the curve,' the take-off point where incremental costs begin to exceed incremental benefits." *Id.* at 330

(statement of House Manager Rep. Roberts).

So, too, some of the justifications that Congress gave for making subsequent changes in the law to provide for additional variances in narrowly-defined circumstances mirror some of the arguments petitioners advance now before this Court. See, *e.g.*, 3 *Leg. Hist.* 258 (Conference Report) (new variance in "recognition that there are some coastal areas of the United States * * * where natural factors provide *** sufficient elimination of traditional forms of pollution"). But, of course, that is precisely why the subsequent amendments upon which petitioners rely cut against petitioners' position. They demonstrate the correct way to change the law if one believes, as petitioners plainly do, that statutory provisions enacted in 1972 may be unduly harsh in some possible application. No doubt petitioners are disappointed that their efforts to date to persuade Congress have been unsuccessful. See, *e.g.*, H.R. Rep. No. 112 104th Cong., 1st Sess. Pt. 1, at 27-28 (1995) (H.R. 961, § 318, proposing to amend Section 316(b) to allow for consideration of "[t]he relative environmental, social, and economic costs and benefits"). But such failure before Congress provides no basis for crossing the street and seeking relief from this Court.

3. Finally, there is no merit to petitioners' contentions that the ruling below relied on a "plain statement rule" disfavoring cost-benefit analysis or somehow contravened this Court's decision in *Chevron v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984), by failing to treat statutory silence as establishing ambiguity. See U.S. Br. 30-32; Entergy Br. 24, 26 n.8.

a. First, neither environmental respondents nor

the Second Circuit relied on any "plain statement rule" that disfavors in all contexts a conclusion that Congress has authorized an agency to engage in cost-benefit comparison. Like the court below, we contend only that the meaning of the words Congress has chosen depends on their statutory context and whether that context makes it more or less likely that Congress intended a particular result in the absence of an express statement one way or the other. See, *e.g., Dolan v. Postal Service*, 546 U.S. 481, 486 (2006); *Davis v. Michigan Dept. of Treasury*, 489 U.S. 803, 809 (1989). That is why "'[i]t is generally presumed that Congress acts intentionally and purposely' when it 'includes particular language in one section of a statute but omits it in another.'" *City of Chicago v. Environmental Defense Fund*, 511 U.S. 328, 338 (1994).

This Court has applied this reasoning repeatedly in construing statutes, including in cases where the question relates to the agency's authority to compare costs with benefits (*American Textile Manufacturers Institute, Inc. v. Donovan*, 452 U.S. at 510) or even to consider costs at all (*Union Electric Co. v. EPA*, 427 U.S. 246, 257 n.5 (1976)). Of particular relevance, the Court did so most recently in *Whitman v. American Trucking*, in determining whether Congress intended to authorize EPA to consider compliance costs in establishing air quality standards under the Clean Air Act. The Court "refused to find implicit in ambiguous sections of the Clean Air Act an authorization to consider costs that has elsewhere, and so often, been expressly granted." 531 U.S. at 467. The same reasoning applies here. See 531 U.S. at 468-69 ("The implausibility of Congress's leaving a highly significant issue unaddressed (and thus 'delegating' its resolution to the administering agency) is assuredly one of the factors to be considered in

determining whether there is ambiguity.").

b. Nor is there any tension between relying on Section 316(b)'s plain meaning and *Chevron*. A statute is not "silent" for *Chevron* purposes whenever the statutory language does not expressly address the precise legal question at issue. The Clean Air Act in *American Trucking* did not have to provide expressly that EPA could not consider costs in establishing national ambient air quality standards for the Act to have a plain meaning. Nor did the Resource Conservation and Recovery Act in *City of Chicago v. Environmental Defense Fund* have to provide expressly that a particular ash residue was not exempt from hazardous waste regulation for that Act to have a plain meaning. In light of the statutory language and structure, the absence of an express exemption was what mattered. 511 U.S. at 334-35. The same is true here.

C. EPA's Implementation of Section 316(b) Does Not Defeat Its Plain Meaning

1. Petitioners claim that the lower court's plain meaning interpretation cannot be squared with EPA's interpretation of Section 316(b) over the last thirty years. See U.S. Br. 27, UWAG Br. 15, 37, 41. They are mistaken. Contrary to their characterization of EPA's past practice, until the rulemaking at issue in this case, EPA did not claim the authority to inject a wide-ranging cost-benefit analysis into standard setting under Section 316(b). Indeed, EPA had denied, rather than claimed, such authority, and its current rulemaking finds no historical precedent.

When EPA first faced the question presented in this case in the original 1976 rulemaking designed to implement Section 316(b), it flatly rejected industry's

claim that cost-benefit analysis was required (see 41 Fed. Reg. 17388) and, even more important, did not leave any room for petitioners' claim that the Agency was addressing only whether such analysis was "required" rather than "permitted." See UWAG Br. 38-39. EPA then explained that cost-benefit analysis was not appropriate because "[t]he statute *directs* the Agency to insure that enumerated aspects of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 41 Fed. Reg. 17388 (emphasis supplied). Accordingly, "[o]nce such adverse effects have been identified * * *, then the effort *must* be to select the most effective means of minimizing (*i.e.*, 'reducing to the smallest possible amount or degree') those adverse effects." *Id.* (emphasis supplied). See J.A. 41.

To be sure, in the years between the judicial rejection of EPA's initial rulemaking and the Agency's promulgation of the rules challenged here, EPA did claim that the Clean Water Act allowed permitting agencies in individual permit proceedings to apply a "wholly disproportionate" test in fashioning requirements applicable to a particular cooling water intake structure. See, *e.g.*, U.S. Br. 5, 27-28. We do not read this past Agency administrative practice as supporting EPA's now far more expansive claim of cost-benefit analysis authority under Section 316(b) or as necessarily inconsistent with our own view of Section 316(b)'s plain meaning.

a. As conceded by the Solicitor General, EPA's newly-claimed cost-benefit authority has a greater "extent" and is "less stringent" than the narrow "wholly disproportionate" test applied by EPA and state agencies in individual permitting decisions. U.S. Br. 5, 27, 41 n.5. In no manner is EPA's current claim of

authority to engage in cost-benefit analysis under Section 316(b) supported by 30 years of administrative practice. U.S. Br. 27; Entergy Br. 23; UWAG Br. 37.

b. Moreover, the wholly disproportionate test is not necessarily, in proper application, inconsistent with Section 316(b)'s plain meaning – so long as it is applied only when the cost is considered "wholly disproportionate" because there are only *de minimis* environmental benefits to be gained by the further expenditures. In that circumstance, Section 316(b)'s plain meaning would be satisfied because EPA could reasonably conclude that the "adverse environmental impact" had already been minimized. See pp. 29-30, *supra*. Indeed, that is all EPA did in the permitting decision in *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306, 311 (1st Cir. 1979), on which petitioners and their amici repeatedly rely. See UWAG Br. 41; U.S. Br. 27; Entergy Br. 57 n.25.[22] There, EPA concluded that a huge increase in cost was not warranted by an insubstantial additional reduction in adverse environmental impact on juvenile smelt or flounder larvae. 597 F.2d at 309-311. Such reasoning is no different from the Second Circuit's ruling below that Section 316(b) permits EPA to decline to require the expenditure of higher compliance costs when the adverse environmental impact to be achieved is "essentially the same" as that obtained by a lower cost option. See Pet. App. 26a.

Significantly, EPA's understanding that it lacked authority to compare costs and benefits under Section

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[22] Contrary to industry petitioners' claims, the First Circuit did not uphold the "wholly disproportionate" test, nor was it asked to pass on it, as the Solicitor General acknowledges. See U.S. Br. in Opp. 13.

316(b) continued through its Phase I rulemaking, long after its announcement of a wholly disproportionate test. In that rulemaking, the Agency made clear that it "ha[d] not selected the best technology available on a cost-benefit basis," but on the basis of technological and economic feasibility, an approach "analogous to the economic achievability analysis it conducts for other technology-based rules under sections 301 and 306 * * *." 66 Fed. Reg. 65309 (2001). And, the site-specific variance EPA included in the Phase I rule was based on compliance costs "wholly out of proportion to the costs EPA was considering in establishing the requirement at issue" and therefore was a *cost-cost* variance, not a *cost-benefit* variance. 40 C.F.R. § 125.85.

2. In all events, even if EPA had in the past applied a "wholly disproportionate" analysis more broadly, any such practice would have no significant bearing on the resolution of this case. The first reason is that EPA was not in any of those individual permitting proceedings interpreting Section 316(b) in a manner, such as a notice-and-comment rulemaking, entitled to *Chevron* deference. Since EPA's initial Section 316(b) regulation was struck down on procedural grounds, EPA has merely been filling the existing regulatory gap during permitting as provided for by Section 402(a)(1)(B). 33 U.S.C. § 1342(a)(1)(B).

The second reason is even more fundamental. In no event can an agency administrative practice trump a statute's plain meaning. That is what this Court meant when it said in *Chevron* that if the meaning of the statutory language is plain, "that is the end of the matter." 467 U.S. at 842-43.

D. Resort to Legislative History Is Unnecessary in this Case, but Its Examination Reinforces Section 316(b)'s Plain Meaning

Given the statutory language's plain meaning, as buttressed by its structure and context, examination of the legislative history is unnecessary. Only because petitioners nonetheless purport to proffer some legislative history in support of their claim, we offer further discussion for those interested.

1. To support their claim, petitioners seize upon an isolated floor statement by a single member of Congress who describes the Section 316(b) standard in terms of "practicability." Indeed, EPA in its rulemaking effectively treats this statement as though its words were the statutory language. Pet. App. 252a. In no event can this statement support the weight petitioners claim.

Whatever one thinks of legislative history, it can never *add* words to the statute, let alone significant ones. But, that is precisely what petitioners seek to do. They want to add to Section 316(b) the word "practicable," which nowhere appears in the statutory provision. And, then, once added, they want to claim that this same word is of enormous substantive import.

2. A more in-depth examination of Section 316(b)'s historical origins, moreover, leaves no doubt that Congress intended the meaning that is plain on the face of the statute. As described above (see pp. 6-14, *supra*), in drafting the statute in 1972, the legislators engaged in intense and protracted debate on the extent to which EPA should be authorized to consider costs and also to relate costs to benefits in establishing environmental protection standards. This dispute went to the core of the legislative policy debate.

a. The Senate and House initially had sharply contrasting views on the issue, with the Senate favoring a technology-based approach that denied EPA such authority and the House favoring a water quality approach that provided for such agency authority. Following months of debate and precise drafting, the two chambers finally reached agreement on a bill that adopted the Senate approach in almost all significant respects and, even then, had to override a veto triggered by the President's concerns about costs and benefits. The formal legislative history, especially the accompanying legislative reports, makes clear the dramatic new direction that Congress ultimately embraced. The legislators completely revamped the federal water quality protection program in every significant respect, including its primary reliance on application of water quality standards. See *EPA v. California State Water Resources Control Board*, 426 U.S. at 202. The less formal history, including the numerous documents prepared by members of Congress and committee staff leadership during the conference proceedings – draft statutory language, memoranda, and notes on meetings – tells the same story, only in greater detail. See notes 6-8, *supra*.

The final legislative enactment rejected a series of House proposals to confer on EPA the authority to engage in a comparison of costs and benefits in determining environmental protection standards. Congress rejected providing EPA with such authority in determining BAT (see p. 9, *supra*); in determining whether BAT would even apply (*id.* at 9-10); in determining BDT for new sources (*id.* at 10); and in determining controls on thermal discharges (*id.* at 12-13). Such a consistent manifestation of congressional intent to refuse to enact language that would have

provided EPA with general authority to compare costs and benefits leaves no room for petitioners' effort to read such authority back into the statute by way of strained and unnatural readings of the words of the law Congress did pass.

b. Not surprisingly, the drafting history of Section 316(b) is in full accord. As previously described (see pp. 5-6, 12-13, *supra*), Congress became aware of the cooling water intake issue at first because of its relationship to the thermal discharge issue. Congress ultimately decided to break the two apart into two distinct subsections. But, although the House ultimately prevailed in its effort to allow for a biologically-based exception to the application of technology-based requirements in Section 316(a) – "the pro[t]ection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" (33 U.S.C. § 1326(a)) – the compromise the conferees finally struck in the closing days of the conference did not include a similar exemption in Section 316(b), let alone the sweeping cost-benefit comparison authority EPA now seeks to assert. See note 8, *supra*. Instead, Section 316(b) demanded a technology-based standard that would "minimiz[e] adverse environmental impact" using "best technology available" and, unlike Section 316(a), would not relax that standard based on achievement of a statutorily-prescribed biological standard. The final bill also rejected the original House proposal for Section 316(a), which would have broadly authorized EPA to consider the "relative costs and benefits" of control options and to exempt a source if the costs bore "no reasonable relationship to the economic and social benefits." H.R. 11896, § 316(b)&(d), 1 *Leg. Hist.* 1044. Here too, Congress displayed its determination to deny EPA authority to engage in cost-benefit analysis – an intent

wholly inconsistent with petitioners' claim that Congress delegated EPA such authority under Section 316(b).

E. This Court Must Respect the Policy Choice Made by Congress

1. No less than in 1972, many today sharply disagree about the use of cost-benefit analysis in the establishment of environmental performance standards and, relatedly, the wisdom of delegating to EPA the authority to base those standards on its independent weighing of costs and benefits. Some support such a delegation (*e.g.*, Cass R. Sunstein, *The Cost-Benefit State: The Future of Regulatory Protection* (2002)); others oppose (*e.g.*, David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 B.C. Envtl. Aff. L. Rev. 1 (2005); Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection,* 150 U. Pa. L. Rev. 1553 (2002)); and some propose a middle ground (*e.g.*, Richard L. Revesz & Michael A. Livermore, *Retaking Rationality – How Cost-Benefit Analysis Can Better Protect the Environment and Our Health*, 1-45 (2008); Sidney A. Shapiro & Christopher H. Schroeder, *Beyond Cost-Benefit Analysis: A Pragmatic Reorientation*, 32 Harv. Envtl. L. Rev. 433 (2008)).

2. But, as the Solicitor General acknowledges, "[t]he question presented here is not whether or to what extent cost benefit analysis is a good thing." U.S. Br. 14. The only question before the Court is the strictly legal question posed by this Court in granting the petition: whether Congress authorized EPA in Section 316(b) to compare costs and benefits in determining BTA. Unlike

several of petitioners' amici (*e.g.*, American Enterprise Institute, Pacific Legal Foundation), many of those who advocate greater use of cost-benefit analysis also apprehend the limits of the judicial function. They recognize the essential difference between what they believe the law should be and what the law is; they acknowledge that Congress has in fact widely rejected the view that cost-benefit analysis should be the central touchstone in all environmental lawmaking; and they understand the reasons for that congressional determination, even if they disagree with it as a matter of policy. See Hon. Stephen Breyer, *Breaking the Vicious Circle – Toward Effective Risk Regulation*, 41-42 (1993) ("There are institutional reasons * * * why Congress may wish to write legislation of this kind. * * * * Congress may distrust the Executive Branch to carry out a more broadly worded instruction with sufficient vigor."); see also *id.* at 57 (referring to "a history of conflict arising out of what Congress saw as an Executive Branch effort to curtail environmental regulation"); Robert H. Frank & Cass R. Sunstein, *Cost-Benefit Analysis and Relative Position*, 68 U. Chi. L. Rev. 323, 331 (2001) ("Presidents and courts have circumscribed authority; they must act consistently with federal statutes, which often forbid cost-benefit balancing. Consider, for example, * * * the Clean Water Act * * *, which contain[s] provisions banning agencies from balancing costs against benefits."); Cass R. Sunstein, *Which Risks First?*, 1997 U. Chi. Legal F. 101, 134 (identifying BAT as one of the "most criticized features" of the Clean Water Act because of the absence of cost-benefit comparison authority); Eric A. Posner, *Controlling Agencies with Cost-Benefit Analysis: A Positive Political Theory Perspective*, 68 U. Chi. L. Rev. 1137, 1182 (2001) ("Agencies often provide implausible estimates of costs and benefits, use different discount

rates and valuations across regulations, and even fail to monetize or quantify all the relevant costs and benefits."); see also Revesz & Livermore, *Retaking Rationality*, *supra* at 55-147 (detailing "eight fallacies" of cost-benefit analysis).

3. Finally, the rulemaking at issue in this case highlights the reasons why Congress decided against authorizing EPA to strike its own cost-benefit balance in determining BTA. See Economists Frank Ackerman, et al. Amicus Br. 29-35; OMB Watch Amicus Br. II.C. In purporting to engage in cost-benefit analysis, EPA assigned no dollar value to one of the most significant impacts of regulating cooling water intake structures: saving aquatic organisms that remain in the ecosystem. EPA monetized only fish that could be caught and sold commercially. Pet. App. 482a-485a. By its own admission, the Agency gave no dollar value to 98.2 percent of organisms saved by its own Phase II rule, let alone those greater numbers that might have been saved by more demanding performance standards, not because they lacked any value, but because it was too difficult to determine a meaningful market value for them. See *id.* at 499a. This is just one of the many limitations in the cost-benefit comparison that EPA performed in the Phase II rulemaking. See J.A. 211-244 (comment letter of Dr. Frank Ackerman).[23]

It was just because of these kinds of limitations in the application of cost-benefit analysis to the aquatic environment, which had plagued the pre-1972 law, that

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[23] Relatedly, several states complained about the enormous burden that would be imposed on them, in their capacity as permitting authorities, were they required to undertake the factfinding necessary for cost-benefit comparisons. See J.A. 209-210, 252, 257-58, 270-71.

Congress made a different policy choice in favor of technology-based performance standards such as BTA. Many believe that Congress's bold move in 1972 in choosing the technology-based approach over the prior water quality and cost-benefit balancing approach is the major reason for much of the Clean Water Act's success during the past several decades. See Environmental Law Professors Amicus Br. I.C. But here, too, it is ultimately for Congress to decide which regulatory techniques will be most effective in addressing the nation's environmental problems.

"The question * * * is not what a court thinks is generally appropriate to the regulatory process; it is what Congress intended for *these* regulations." *E.I. du Pont de Nemours*, 430 U.S. at 138; see *Ali v. Federal Bureau of Prisons*, 128 S. Ct. 831, 841 (2008) ("We are not at liberty to rewrite the statute to reflect a meaning we deem more desirable. Instead, we must give effect to the text Congress enacted * * *."). "All the policy reasons in the world cannot justify reading a substantive provision out of a statute." *North Carolina v. EPA*, 531 F.3d 896, 910 (D. C. Cir. 2008).[24]

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[24] Because the Second Circuit invalidated EPA's rejection of closed-cycle cooling and its proffered "suite of technologies" on a ground entirely separate and independent from the single issue on which this Court granted review – EPA's authority to compare costs and benefits – the lower court's remand of those aspects of the rulemaking will, in all events, be undisturbed by the Court's resolution of the question presented. The court's threshold ruling was the absence of any adequate EPA explanation of the rulemaking's basis. The court made clear that this was an independent error: "EPA was required to explain its judgment and the basis for it" (Pet. App. 35a); and "[t]he record evidence alone here * * * is oblique, complicated, and insufficient to permit us to determine what the EPA relied upon in reaching its conclusion" (*id.*). The court faulted EPA for failing to provide (1) a record that

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

EDWARD LLOYD
Environmental Law Clinic
Columbia University
School of Law
435 West 116th St.
New York, NY 10027
(212) 854-4291

P. KENT CORRELL
300 Park Ave., 17th Fl.
New York, NY 10022
(212) 475-3070

RICHARD J. LAZARUS *
600 New Jersey Ave., N.W.
Washington, DC 20001
(202) 662-9129

REED W. SUPER
116 John Street
Suite 3100
New York, NY 10038
(212) 791-1881

*Counsel of Record

SEPTEMBER 2008

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would permit a court "to discern * * * how the EPA determined that the cost of closed-cycle cooling could not be reasonably borne by the industry" (Pet. App. 33a); (2) an explanation of "its statement that the suite of technologies 'approach[es]' the performance of closed-cycle cooling" (*id.*); and (3) an "adequate comparison in the Rule's proposal, the final Rule or its preamble, or the EPA's submissions to this Court of the effectiveness of closed-cycle cooling and the group of technologies whose effectiveness provided the basis for the Phase II Rule's performance standards" (*id.* at 33a-34a). An agency must at a minimum "cogently explain why it has exercised its discretion in a given manner." See *Motor Vehicles Manufacturers Ass'n v. State Farm*, 463 U.S. 29, 48 (1983). In all events, should this Court reverse on the sole question presented, it should leave for the Second Circuit the question of the impact, if any, on that court's other rulings. As described above, moreover, the Court should decline petitioners' efforts to have this Court consider issues distinct from the question presented, including the reasonableness of EPA's ranges (see note 16, *supra*) and the need for site-specific BTA determinations (see note 17, *supra*)

RESPONDENT'S BRIEF

Supreme Court, U.S.
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In The
Supreme Court of the United States

ENTERGY CORP., *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF FOR THE STATES AS RESPONDENTS

PATRICK C. LYNCH
Attorney General of Rhode Island
TRICIA O'HARE JEDELE, *Counsel of Record*
Special Assistant Attorney General
150 South Main Street
Providence, RI 02903
(401) 274-4400

(Additional Counsel Listed On Inside Cover)

COCKLE LAW BRIEF PRINTING CO (800) 225-6964
OR CALL COLLECT (402) 342-2831

RICHARD BLUMENTHAL
Attorney General
of Connecticut
KIMBERLY MASSICOTTE
MATTHEW LEVINE
Assistant Attorneys General
P.O. Box 120
55 Elm Street
Hartford, CT 06141-0120
(860) 808-5250

MARTHA COAKLEY
Attorney General
of Massachusetts
ANDREW GOLDBERG
Assistant Attorney General
1 Ashburton Place,
18th Floor
Boston, MA 02108
(617) 727-2200

ANDREW M. CUOMO
Attorney General of New York
BARBARA D. UNDERWOOD
Solicitor General
ANDY D. BING
Deputy Solicitor General
DENISE A. HARTMAN
Assistant Solicitor General
MAUREEN F. LEARY
Assistant Attorney General
The Capitol
Albany, NY 12224
(518) 473-6085

JOSEPH R. BIDEN III
Attorney General
of Delaware
KEVIN MALONEY
Deputy Attorney General
820 N. French Street,
6th Floor
Wilmington, DE 19801
(302) 577-8327

ANNE MILGRAM
Attorney General
of New Jersey
ELLEN BARNEY BALINT
Deputy Attorney General
P.O. Box 093
25 Market Street
Trenton, NJ 08625-0093
(609) 984-5065

QUESTION PRESENTED

Whether § 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures?

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STATEMENT OF THE CASE

Section 316(b) of the Clean Water Act[1] addresses the impact to fish and other aquatic life caused by the massive withdrawal of water at cooling water intake structures. Section 316(b) mandates that:

> Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect *the best technology available for minimizing adverse environmental impact*.

CWA § 316(b), 33 U.S.C. § 1326(b) (emphasis added).

This case is about whether in selecting the *best technology available for minimizing adverse environmental impact* under section 316(b), the United States Environmental Protection Agency ("EPA") may reject the best technology based on the agency's comparison of costs with the value of benefits. Specifically, the question is whether the language or purpose of the statute supports EPA's reliance upon a cost-benefit analysis in establishing a national rule governing intake structures, or in setting site-specific permitting alternatives for intake structures.

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[1] The Federal Water Pollution Control Act, as amended, is commonly referred to as the Clean Water Act (herein referred to as "CWA" or "the Act"). *See* 86 Stat. 816, 33 U.S.C. § 1251, *et seq.*

The State-Respondents[2] agree with the Second Circuit Court of Appeals' conclusion that, "[w]hile the statutory language suggests that the EPA may consider costs" in making this determination, "cost-benefit analysis is not similarly supported by the language or purpose of the [Act]." Pet. App. 24a (*Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 99) (2d Cir. 2007) ("*Riverkeeper II*").[3] Congress' use of the word "available" allows for a limited consideration of cost, but when viewed in context, the technology standard in section 316(b) bars EPA from relying on a cost-benefit analysis when establishing the national rule or site-specific permitting alternatives for intake structures. In *Riverkeeper II*, the Second Circuit properly understood the concept of "availability" in terms of "feasibility," and thus approved a type of feasibility analysis rather than a cost-benefit analysis as being consistent with section 316(b). *See* Pet. App. 27a (*Riverkeeper II*, *id.* at 100) (citing *American Textile Mfrs. Institute, Inc. v. Donovan*, 452 U.S. 490, 509-510 (1981) ("*American Textile*") ("Congress itself has defined the relationship between technology costs and environmental benefits, and placed the emphasis on minimizing environmental impacts.").

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[2] State-Respondents include: the States of Rhode Island, Connecticut, Delaware, New Jersey, and New York, and the Commonwealth of Massachusetts.

[3] Citations to "Pet. App." refer to the Appendix to the Petition for Certiorari filed by Entergy Corp. in No. 07-588. "J.A." refers to the Joint Appendix. "R.A." refers to the addendum included in the State-Respondents' brief.

Thus, when promulgating national performance standards to reflect the statutory mandate, EPA may consider cost in assessing the "availability" of a technology in terms of its economic and technological feasibility, or in evaluating comparably effective technologies. The language of the statute does not, however, authorize EPA to require less than the top-performing technology for minimizing impact based on its view that the cost of the top-performing technology outweighs the value of the benefits the technology would achieve.

The Environmental Impact Caused By Intake Structures

Electric power generating plants and other facilities ("power plants") withdraw hundreds of billions of gallons of water daily from the Nation's waters through "intake structures" to cool nuclear reactors, or coal or gas-fired turbines, and other machinery and equipment. Pet. App. 169a-170a (69 Fed. Reg. 41,576, 41,586 (July 9, 2004)). After the water is drawn, and used by the power plant for cooling purposes, it is discharged back to the water bodies as thermally polluted effluent.

A power plant's intake of cooling water and subsequent discharge of heated effluent causes two distinct types of injuries to aquatic life and the integrity of the Nation's waters. The process of withdrawing water through the intake structure annually kills and injures trillions of fish, shellfish

and other aquatic organisms by trapping them against the screens located at the mouth of the intake structure ("impingement"), or by drawing them into the facility with the cooling water ("entrainment").[4] Subsequently, heated effluent is discharged back into the water body, fundamentally altering the water body's physical and chemical characteristics and thereby making it potentially uninhabitable for fish and other aquatic life.

The Clean Water Act

Congress enacted the Act in 1972 "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA, as amended, 86 Stat. 816, 33 U.S.C. § 1251, *et seq.* In section 316 of the Act, Congress addressed environmental harm caused by both intake structures and thermally polluted effluent. In subsection (b), Congress directed EPA, when it establishes effluent limitations for these facilities, to require power plants to use the *best technology available for minimizing adverse*

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[4] A single power plant may impinge more than a million adult fish in a three-week period. *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 181 (2d Cir. 2004) ("*Riverkeeper I*"); and may impinge and entrain trillions of aquatic organisms in a year. Pet. App. 179a (69 Fed. Reg. 41,576, 41,588 (July 9, 2004)). The number killed or injured is largely corollary to the amount of water withdrawn and the velocity at which it is being withdrawn, *i.e.*, the more water withdrawn and the higher the velocity of the withdrawal, the greater the harm. *See* Pet. App. 230a, 241a, and 288a (69 Fed. Reg. at 41,599, 41,601, and 41,612).

environmental impact at their intake structures. CWA § 316(b), 33 U.S.C. § 1326(b). In contrast to this unequivocal directive regarding intake structures, in subsection (a) Congress authorized an exception to compliance with the national effluent limitations for thermal pollution where a power plant can demonstrate that a less stringent limitation would "assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife on that water body." *See* CWA § 316(a), 33 U.S.C. § 1326(a).

Because section 316(b) addresses intake structures, not effluent, it stands apart from the statutory provisions elsewhere in the Act that govern effluent limitations for point source discharges. In section 301, for instance, Congress established a statutory framework for EPA to set effluent limitations for existing facilities. 33 U.S.C. § 1311. Likewise, section 306 of the Act provides EPA with the statutory framework for setting effluent limitations for new sources. 33 U.S.C. § 1316. In these provisions, Congress established discrete technology-based standards for different types of pollutants and facilities.

With respect to each of the technology standards, Congress expressly told EPA when and how to consider costs depending on the technology standard being applied. CWA §§ 301, 304, 33 U.S.C. §§ 1311, 1314. Congress directed EPA to weigh costs in relation to water quality benefits in only two instances: when setting effluent limitations reflecting best practicable control technology ("BPT") – a

standard applicable to existing facilities only until 1989 (*see* CWA § 301(b)(1)(A), 33 U.S.C. § 1311(b)(1)(A)) and CWA § 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B) (directing EPA to consider "total cost of application of technology in relation to effluent reduction benefits to be achieved from such application"); and when setting effluent limitations reflecting the best conventional technology ("BCT") – a standard enacted in the 1977 amendments to the CWA applicable only to conventional pollutants (*see* CWA § 301(b)(2)(E), 33 U.S.C. § 1311(b)(2)(E) and CWA § 304(b)(4)(B), 33 U.S.C. § 1314(b)(4)(B)) (directing EPA to consider "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent benefits derived."). With respect to all other *point sources*, whether from existing or new facilities, Congress directed EPA to take into account the cost of achieving effluent reductions, but did not direct EPA to weigh technology costs against reduction benefits. *See* CWA § 301(b)(2)(A), 33 U.S.C. § 1311(b)(2)(A); CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1).

Thus, while Congress expressly told EPA to consider technology costs, and in two instances costs in relation to reduction benefits, when setting national effluent limitations, it did not expressly tell EPA to consider costs when establishing national performance standards for intake structures. Instead, section 316(b) imposes on EPA the unqualified mandate that intake structures at both new and existing facilities shall reflect the *best technology available for minimizing adverse environmental impact*.

EPA's Historical Interpretation of Section 316(b)

A little more than a year after Congress passed section 316(b), EPA issued a draft rule "to insure that intake structures reflect the best technology available for minimizing adverse environmental impact." *See Proposed Rule, Preamble,* 38 Fed. Reg. 34,410 (December 13, 1973). On April 26, 1976, EPA issued the final rule, which incorporated (but did not publish as part of the rule), a "Development Document for Proposed Best Technology Available for Minimizing Adverse Environmental Impact of Cooling Water Intake Structures" ("Development Document"). *See* Final Rule at 41 Fed. Reg. 17,387, 17,390 (April 26, 1976),[5] and *see* Development Document at p. 175, available at http://nepis.epa.gov. The Development Document listed several different technologies that were, at the time, "available."[6] Among the most effective of these technologies was "recirculating cooling water systems employing off stream means to transfer heat directly to the atmosphere to minimize

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[5] As a result of a successful industry challenge to EPA's 1976 Rule, the Fourth Circuit Court of Appeals remanded the 1976 Rule because the Development Document had not been published with the 1976 Rule. *See Appalachian Power Co. v. Train*, 566 F.2d 451 (4th Cir. 1977).

[6] The technology available to address the adverse impact associated with intake structures are relatively limited, and have included essentially the same set of technologies for more than thirty years. The technologies include various screening methods, fish return or barrier systems, change of intake location, and reductions in intake flow.

or in some cases eliminate the use of cooling water" (known as "closed-cycle cooling").

Closed-cycle cooling continues to be one of the top technological performers at intake structures in the industry, eliminating mortality from impingement and entrainment by up to 98 percent when compared with conventional once-through systems. Pet. App. 239a-240a (69 Fed. Reg. 41,601). EPA has construed section 316(b) to require closed-cycle cooling technology as the *best technology available for minimizing adverse impact* at more than a dozen existing power plants, both before it published the 1976 Rule and after it was remanded. *See, e.g., Palisades Nuclear Power Plant*, 67 Fed. Reg. 17,122, 17,155 (April 9, 2002); *Consolidated Edison Co. of New York, Inc. v. NYSDEC*, 726 F.Supp. 1404, 1406 (S.D.N.Y. 1989).

The Phase II Rule

In 1993, environmental groups challenged EPA's failure to re-issue regulations governing intake structures. Pursuant to an amended consent decree resolving the case, EPA agreed to issue the intake structure regulations in three phases: the first for new facilities ("Phase I Rule"); the second for existing facilities ("Phase II Rule"); and the third for smaller offshore and coastal facilities ("Phase III Rule"). *See Cronin v. Browner,* 898 F.Supp. 1052 (S.D.N.Y. 1995). In December 2001, EPA issued its final Phase I Rule

for new facilities.[7] In July 2004, EPA issued the final Phase II Rule for existing facilities, at issue here.[8] EPA issued its final Phase III Rule for smaller facilities in June 2006.[9]

The final Phase II Rule applies only to existing facilities "whose primary activity is to generate and transmit electric power and who have a design intake flow of 50 million gallons or greater, and that use at least 25 percent of the water withdrawn for cooling purposes." Pet. App. 189a (69 Fed. Reg. at 41,590). The Phase II Rule establishes "performance standards" – percentage ranges for reducing impingement (80 to 95 percent) and entrainment (60 to 90 percent) – based on a "range of technologies that EPA has determined to be commercially available for the industry as a whole. . . ." Pet. App. 228a (69 Fed. Reg. at 41,599). In the Phase II Rule, EPA interpreted "section 316(b) as authorizing it to

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[7] 66 Fed. Reg. 65,256 (Dec. 18, 2001). The Phase I Rule was challenged by environmental and industry groups, and portions of it were upheld and others remanded to EPA. *See Riverkeeper I, supra,* 358 F.3d 174 (2d Cir. 2004).

[8] Pet. App. 122a. 69 Fed. Reg. 41,576 (July 9, 2004).

[9] 71 Fed. Reg. 35,006 (June 16, 2006). In its Phase III Rule, EPA decided not to issue regulations governing small existing facilities. The Phase III Rule contains intake requirements for new offshore and coastal oil and gas extraction facilities that had been deferred from the Phase I Rule. The Phase III Rule was challenged in the Fifth Circuit Court of Appeals, *Conoco Phillips Co. v. EPA* (Docket No. 06-60662), and on June 8, 2008, that matter was stayed pending this Court's resolution of the challenge to the Phase II Rule.

consider not only technologies but also their effects on and benefits to the water from which the cooling water is withdrawn." Pet. App. 157a (69 Fed. Reg. at 41,583); Pet. App. 249a-250a (69 Fed. Reg. at 41,603).

EPA also compared the efficacy of competing technologies. Specifically, EPA compared the effectiveness of various technologies in reducing impingement and entrainment, and concluded that other design and construction technologies, can approach closed-cycle cooling at less costs. Pet. App. 260a-261a (69 Fed. Reg. at 41,606). EPA recognized that closed-cycle cooling is the most effective technology, *see* Pet. App. 239a-240a (69 Fed. Reg. at 41,601), but rejected closed-cycle cooling because of its high costs. *See* Pet App. 255a (69 Fed. Reg. at 41,605).

EPA therefore set the low ends of the ranges in the performance standards at 80 percent reduction for impingement and 60 percent reduction for entrainment – far less than the 98 percent reductions that it recognized could be attained by closed-cycle cooling. Pet. App. 239a (69 Fed. Reg. at 41,601). EPA based the lower impingement and entrainment reduction percentages on the performance of less costly screening technologies. Pet. App. 244a (69 Fed. Reg. at 41,602). All of the evidence in the record indicated that screening technologies are far less effective at reducing the impacts associated with

impingement and entrainment at major power plants.[10]

The Phase II Rule establishes various compliance alternatives for achieving the performance standards. Recognizing that closed-cycle cooling has been installed at more than a dozen existing facilities, the first alternative allows a facility to demonstrate compliance with the impingement performance standard by showing that it has reduced its flow commensurate with closed-cycle cooling. Pet. App. 556a (40 C.F.R. § 125.94(a)(1)(i)). As a second compliance alternative, the Rule deems a facility in compliance with the impingement performance standard if it shows that it has reduced its intake velocity to 0.5 feet per second or less. Pet. App. 556a (40 C.F.R. § 125.94(a)(1)(ii)). Under another compliance alternative, a facility may demonstrate compliance with both impingement and entrainment performance standards through a combination of design and construction technologies, commonly

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[10] *See* Science Applications International Corporation ("SAIC"), Background Paper Number 3, wherein SAIC, on behalf of EPA, concluded:

> The main finding with regard to intake screen systems is that they are limited in their abilities to minimize adverse aquatic impact . . . *and many of our major power plants have been in serious trouble because of cooling water conditions [with] which our U.S. screening system cannot cope.*

SAIC *Background Paper Number 3: Cooling Water Intake Technologies*, EPA, April 4, 1994, at 3-5 (emphasis in original).

referred to by EPA as a "suite of technologies" that it considered *best technology available for minimizing adverse environmental impact*, including wedgewire screens, barrier systems, fish return systems, Pet. App. 592a (40 C.F.R. § 125.99(a)), and operational measures and/or restoration measures.[11] Pet. App. 556a-557a (40 C.F.R. § 125.94(a)(2-4)).

The Phase II Rule also allows two kinds of site-specific "compliance alternatives" that do not actually require compliance with the Rule's percentage reduction standards for impingement and entrainment. Pet. App. 557a (40 C.F.R. § 125.94(a)(5)). First, if the facility demonstrates that compliance costs would be significantly greater than the compliance costs considered by EPA in the Rule, the facility may come "as close as practicable" to the performance standard ("cost-cost variance"). Pet. App. 557a (40 C.F.R. § 125.94(a)(5)(i)). Second, if the facility demonstrates that compliance costs would be "significantly greater than the benefits of complying" with the performance standards ("the cost-benefit variance"), the facility may come "as close as practicable" to the performance standard. Pet. App. 559a .(40 C.F.R. § 125.94(a)(5)(ii)). EPA considered

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[11] The Second Circuit struck down the Phase II Rule's provisions that allowed a power plant to comply with section 316(b) through the use of restoration measures in lieu of technology. Pet. App. 43a-49a (*Riverkeeper II*, *supra*, 475 F.3d at 108-110). This Court limited the question presented to the cost-benefit issue.

only the costs associated with installing submerged cylindrical wedgewire screen technology to treat the total cooling water intake flow; these "compliance alternatives," therefore, could preclude permitting agencies from requiring the most effective intake technology, closed-cycle cooling, at any power plant in the country. Pet. App. 244a (69 Fed. Reg. at 41,602).

Riverkeeper II

On January 25, 2007, the Second Circuit Court of Appeals concluded that section 316(b) does not authorize EPA to promulgate a rule in which the *best technology available for minimizing adverse environmental impact* is determined by comparing the cost of a technology with the value of the environmental benefit it will achieve, or to "consider the relationship of a technology's cost to the level of reduction of adverse environmental impact it produces." Pet. App. 25a. (*Riverkeeper II*, *supra*, 475 F.3d at 99). The court prefaced its holding that EPA can consider cost in "a limited fashion and not as a primary consideration," *id.*, by highlighting the difference between a cost-benefit analysis, like the one prescribed by Congress for effluent standards in section 301(b)(1)(A), and "cost-effectiveness." Quoting from Office of Management and Budget ("OMB") Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Appendix A (1992), the court explained the difference between the two methods as follows:

> "[B]enefit-cost analysis" [is] "[a] systematic quantitative method of assessing the desirability of government projects or policies when it is important to take a long view of future effects and a broad view of possible side-effects" and "cost effectiveness" [is] "[a] systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits or a given objective."

Pet. App. 23a. (*Riverkeeper II*, 475 F.3d at 98, n.10). In other words, a cost-effectiveness analysis seeks the least costly method of achieving a specified result, while a cost-benefit analysis compares costs with the value of benefits, and chooses the result where the greatest value of net benefits is not outweighed by the costs of achieving those benefits.

The Second Circuit concluded that section 316(b) allows EPA, when it sets national standards for intake structures, and when it establishes criteria for site-specific permitting to consider costs only in terms of feasibility and "cost-effectiveness." The court reached this conclusion based on the statute's text, the context provided by the CWA, historical perspective expressed in documents like those produced by OMB, and the reasoning and authority found in various court opinions, including *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71 (1980); *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002); and *American Textile*, *supra*, 452 U.S. at 509.

The Second Circuit remanded the Phase II Rule to EPA for reconsideration, stating that it was "unclear whether the Agency improperly weighed the benefits and the costs of requiring closed-cycle cooling," because EPA had explained that "its rejection of closed-cycle cooling as [best technology available for minimizing adverse environmental impact] was based on 'total social costs' and 'lack of cost-effectiveness.'" Pet. App. 32a (*Riverkeeper*, 475 F.3d at 102) (citing 69 Fed. Reg. at 41,606). In July 2007, EPA suspended the Phase II Rule pending further rulemaking. *See* 72 Fed. Reg. 37,107 (July 9, 2007).

SUMMARY OF THE ARGUMENT

Congress' intent in section 316(b) is unambiguous. EPA must select the top-performing technology available for the purpose of minimizing adverse environmental impact.

The plain language of section 316(b) requires EPA to promulgate a national rule that minimizes the killing and injuring of fish and other aquatic life. By using this language, Congress itself defined the relationship between technology costs and the value of environmental benefits. With calculated intention, Congress directed EPA to minimize adverse environmental impact, and EPA may not substitute its own different policy choice. Congress did not authorize EPA to compare the costs of the best technology available with the value of the benefits

that the technology would achieve when establishing a national rule for minimizing impact, or in setting criteria applicable at the permitting level. Because Congress did not expressly tell EPA to consider cost, cost cannot be a primary consideration, and most especially cannot be compared with benefits. Cost, therefore, is only allowed as a secondary factor to be considered by EPA when evaluating the best technology's "availability." A finding of "availability" will necessarily require EPA to determine the feasibility of the top-performing technology, but a feasibility analysis is not a cost-benefit analysis.

Reading section 316(b) in context confirms this straightforward meaning. Throughout the CWA, Congress told EPA when and how it could consider costs. Congress drafted different technology standards for different categories of pollutants and facilities. In some cases, Congress required EPA to consider costs in relation to benefits. In other instances, Congress authorized only a consideration of cost without comparison to benefits. What little legislative history exists supports this plain meaning.

Allowing EPA to rely on its own cost-benefit evaluation, where Congress already decided the question, would not, as Petitioners suggest, be within its "gap-filling" discretion. Congress did not acquiesce or delegate any power to EPA to employ a cost-benefit analysis in section 316(b). Instead, Congress expressed its clear intent to minimize the adverse environmental impact, *even if* minimizing impact

means that the selected technology will impose high costs on the industry or at a particular facility.

Petitioners argue that because selected definitions of key statutory terms can appear ambiguous in contexts other than section 316(b), the Court should presume ambiguity and defer to EPA's interpretation as reasonable. But the absence of an express reference to cost-benefit analysis in section 316(b) does not create ambiguity where the language in the provision clearly expresses Congress' intent.

ARGUMENT

SECTION 316(b) OF THE CLEAN WATER ACT DOES NOT ALLOW EPA TO RELY ON A COST-BENEFIT ANALYSIS AS THE BASIS FOR ESTABLISHING A NATIONAL RULE FOR INTAKE STRUCTURES OR FOR MAKING SITE-SPECIFIC PERMITTING DECISIONS.

The text of section 316(b) is unambiguous. The language plainly expresses Congress' intent that EPA must select the *best technology available for minimizing adverse environmental impact* associated with intake structures. The statutory phrase unambiguously precludes EPA from comparing costs with the value of the benefits in selecting cooling water intake technology that satisfies the statutory mandate. Rather than weigh costs against benefits, Congress clearly directed EPA to require technology that surpasses all others for achieving the goal of

minimizing the adverse impact associated with using the intake structures to the extent that technology is available. EPA may not substitute its policy views for those of Congress.

The United States and Industry Petitioners seek to add a cost-benefit comparison as a factor in the section 316(b) statutory equation. Adding this comparison would circumvent Congress' intent, to restore the Nation's degraded waters by implementing standards based on what the limits of technology can achieve and would resurrect a policy approach to water quality regulation long since abandoned by Congress.

EPA's interpretation therefore fails under step one of the *Chevron* analysis. *See Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-843 (1984) ("If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.").

A. The Plain Language of § 316(b) Requires EPA to Promulgate a Rule That Minimizes Adverse Environmental Impact.

The starting point for construing the statutory standard – *best technology available for minimizing adverse environmental impact* – is the language itself. *Williams v. Taylor*, 529 U.S. 420, 431 (2000) ("We start, as always, with the language of the statute.").

The first word in the standard, "best," means "excelling, or surpassing all others of its kind in inherent quality or according to some standard." *Webster's Third New International Dictionary of the English Language* 208 (Merriam-Webster unabridged ed., 1981) ("*Webster's Third*"). In section 316(b), "best" is used as a superlative to describe the technology that must be selected to achieve the articulated congressional objective; it must surpass all other technologies *for minimizing* adverse environmental impacts. The word "for" is often used to indicate "the purpose or object of" a thing, action, or activity. *Id.* at 886; *see also American Heritage Dictionary of the English Language* 686 (Houghton Mifflin Co., 4th ed., 2006) ("*American Heritage Dictionary*") ("indicates the object, aim, or purpose of an action or activity"). The placement of the word "for" in section 316(b) is the fulcrum of the statutory standard welding the first clause, "best technology available," with the goal of the section, "minimizing adverse environmental impact." Read in conjunction with the prepositional and objective-defining language – *for minimizing impacts* – the word "best" means the top-performing technology for achieving that objective.

The word "minimize" means "to reduce to the smallest possible number, degree, or extent." *Webster's Third*, at 1438. This is the definition EPA gave the word "minimize" when it promulgated the initial rule in 1976. *See* J.A. 41 (41 Fed. Reg. 17,387) (April 26, 1976) (In the preamble discussing "minimizing adverse environmental impact," EPA

explained that, "[o]nce such adverse effects have been identified (or in the case of new structures, predicted) then *the effort must be to select the most effective means of minimizing (i.e., 'reducing to the smallest possible amount or degree') those adverse effects.*") (emphasis added).[12] More recently in its promulgation of the Phase I Rule governing intake structures at new power plants, EPA again adopted the 1976 definition. *See* 40 C.F.R. § 125.83 (defining "minimize" to mean "to reduce to the smallest amount, extent, or degree reasonably possible"). The noun following the verb "minimize" is "impact." "Impact" is defined as "the act of impinging or striking," or "a concentrated force producing change," *Webster's Third*, at 1131, demonstrating Congress' understanding of the nature of the environmental injuries associated with intake structures.

Under section 316(b), the *best technology for minimizing adverse environmental impact* must also

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[12] Later in 1976, in *In re Brunswick Steam Electric Plant*, a Decision of the General Counsel, EPA again consistently discussed the meaning of the word "minimize," stating that:

> The structures must reflect the best technology available for minimizing (*i.e. "reducing to the smallest possible amount or degree"*) adverse environmental impact – significant or otherwise. . . . In other words, the goal of best technology available under § 316(b) is to minimize all adverse impacts – not to reduce the impact to a pre-determined level.

J.A. 60 (*In re Brunswick Steam Electric Plant*, EPA, Decision of General Counsel No. 41) (emphasis added).

be "available." The most quotidian meaning of the word "available" is "capable of use for the accomplishment of a purpose." *Webster's Third*, at 150; *see also American Heritage Dictionary*, at 123 (defining "available" as "present and ready for use; at hand; accessible"). A technology is "available" to the power plant industry, therefore, if it is accessible, or capable of being used by power plants at the time it is chosen.[13] Synonyms for "available," like "practicable" (*i.e.*, "capable of being put into practice" or "capable of being used," *Webster's Third*, at 1780; or "capable of being effected, done, or put into practice; feasible," *American Heritage Dictionary*, at 1377), and "feasible" (*i.e.*, "capable of being done, executed, or effected," *Webster's Third*, at 831 or "possible," *American Heritage Dictionary*, at 646), support the concept that "availability" can be understood in terms of "feasibility," but not in terms of cost versus benefit. These definitions comport fully with the secondary consideration of cost, in terms of "cost-effectiveness" and "feasibility" that the Second Circuit found to be reasonable under section 316(b), and with this Court's view of the distinction between feasibility analysis and cost-benefit analysis. *See American Textile*,

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[13] The Phase II Rule recognizes that closed-cycle cooling is capable of being used by existing power plants. Pet. App. 240a (69 Fed. Reg. at 41,601 ("EPA is nonetheless aware that some existing facilities have installed this highly effective technology and has thus provided a streamlined alternative for such facilities.").

supra, 452 U.S. at 509 (distinguishing feasibility analysis from cost-benefit analysis).

When read together as an "indivisible term of art,"[14] the standard set by section 316(b) plainly directs that, when establishing a national rule, EPA must require the most effective technology at hand for reducing to the smallest possible level the adverse impact associated with intake structures. Congress' use of the purpose-defining language – "for minimizing adverse environmental impact" – reflects its unequivocal emphasis on minimizing impact. Thus, whether the value of impact minimization outweighs the cost associated with using the best technology for that purpose is a question that Congress has already answered.

This Court reached a similar conclusion in *Whitman v. American Trucking Ass'ns, Inc.*, 531 U.S. 457, 467-468 (2001) ("*American Trucking*"). There the Court considered whether the language of section 109(b)(1) of the Clean Air Act ("CAA"), 42 U.S.C. § 7409(b)(1), allowed EPA to consider costs in setting ambient air quality standards. Section 109(b)(1) instructs EPA to set air quality standards "the attainment and maintenance of which[,] . . . allowing an adequate margin of safety, are requisite to protect

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[14] *See Dewsnup v. Timm*, 502 U.S. 410, 423 (1992) (Scalia, J., dissenting, Souter, J., joining) (rejecting the majority's position that "the words 'allowed secured claim' in section 506(d) of the Bankruptcy Code need not be read as an 'indivisible term of art' ").

the public health." 42 U.S.C. § 7409(b)(1). The Court concluded that the text of section 109(b), "interpreted in its statutory and historical context and with appreciation for its importance to the CAA as a whole, unambiguously bars cost consideration from the [national ambient air quality standards]-setting process." *American Trucking*, 531 U.S. at 471.

Likewise, in *American Textile*, the Court construed the phrase "to the extent feasible" to preclude the agency's reliance on cost-benefit analysis in setting the cotton dust standard under the Occupational Safety and Health Act ("OSHA"). *American Textile*, 452 U.S. at 512-513. The Court recognized that "feasibility analysis" and "cost-benefit analysis" are distinct concepts, and explained that cost-benefit analysis imposes an additional and overriding requirement that would countermand the feasibility requirement. *Id.* at 513. Discussing the practical implications of allowing a cost-benefit analysis to substitute for a feasibility analysis, the Court reached the conclusion that "[s]tandards would inevitably be set at the level indicated by cost-benefit analysis, and not at the level specified by [the Act]." *Id. See also id.* at 519 ("Congress meant 'feasible' *rather than* 'cost-benefit'") (emphasis added). The same result would obtain here if EPA were to rely on cost-benefit analysis; "[a]doption of petitioners' interpretation would effectively write [the requirement for minimization of impact] out of [section 316(b)]." *Id.* at 513.

In section 316(b), Congress similarly instructed EPA to set a national standard that would reduce the killing of trillions of fish and other aquatic life to the lowest level possible. The statutory language defines the basic relationship between costs and benefits by mandating the achievement of a particular goal and limiting the achievement only in terms of "availability." Indeed, the Industry Petitioners acknowledge that the courts evaluate the permissibility of a cost-benefit analysis differently where Congress has articulated a specific goal that must be achieved. *See Entergy Br.* at 27 ("The few circuit courts that have read *American Textile* to prohibit cost-benefit analysis in the OSHA context have emphasized the specific and inflexible worker safety goal set by the statute"; and "[t]his Court held that the language in [section] 109(b)(1) plainly requires EPA to set the minimum standards "requisite" to achieve that goal, and that costs were irrelevant."). Here, Congress has in fact articulated the specific goal to be achieved. EPA may not override Congress' choice based on the agency's own policy preference. *Massachusetts v. EPA*, 127 S. Ct. 1438, 1462-1463 (2007) (the exercise of EPA's discretion must fall within defined statutory limits, and "[t]o the extent that this constrains agency discretion to pursue other priorities . . . this is the congressional design."); *Chevron*, *supra*, 467 U.S. at 865-866 (an agency may base its judgments on its own policy choices only where "Congress itself either inadvertently did not resolve [the issue], or intentionally left [it] to be resolved by the agency. . . .").

The United States and Industry Petitioners create a perception of ambiguity by parsing the words in section 316(b). Petitioners then juxtapose a parsed word with an unrelated scenario designed to produce an absurd result, and suggest that acceptance of the fringe definition or concession of deference from the Court are the only means of avoiding the absurdity. But legal ambiguity is not created by perception alone, and absurd results can be avoided without presuming congressional delegation or requiring court-afforded deference to an agency's policy preference for setting intake structure standards according to its own view that a cost-benefit analysis is allowed.[15]

Petitioners' approach to statutory interpretation, arguing that each term listed in section 316(b) can have a number of possible meanings when viewed in isolation from the statutory standard overall, has consistently been rejected by this Court. *See Brown v. Gardner*, 513 U.S. 115, 118 (1994) ("Ambiguity is a creature not of definitional possibilities but of statutory context."); *American Trucking, supra,* 531 U.S. at 466; *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 132-133 (2000) ("*Brown &*

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[15] Industry Petitioners mischaracterize and question the policy goals set by Congress in section 316(b). *See Entergy Br.* at 49 ("a campaign to eliminate impingement and entrainment of fish to the maximum extent possible without regard to cost, is self-evidently unsound policy"); *see also Entergy Br.* at 57 (not allowing consideration of cost versus benefit "places fish and other aquatic organisms on a pedestal never erected by Congress").

Williamson") ("While a word can have more than one meaning in the abstract, that same word can be given concrete meaning by the context in which it appears."). Petitioners' reliance on possible and little-used definitions of a single word cannot trump the meaning of that word when it is viewed in its statutory context.

For example, the United States defines the word "best" as "a relative term capable of different meanings." It argues the "'best' way of pursuing a goal is not always the one that most single-mindedly achieves that goal at all costs." *EPA Br.* at 16. To illustrate this, it suggests that the *best* route home might not be the quickest route. This example, however, ignores the fact that in section 316(b), "best" is relative to a specific Congressional objective – best *for* minimizing impact. If the stated objective, therefore, is to select the best route available *for* arriving home as quickly as possible, then the quickest route, if it is accessible, is indeed the best route. If, on the other hand, the stated objective is to select the best route available *for* arriving home in the safest manner possible, then the best route home might be the longer route with lower speed limits and less traffic regardless of the additional cost in gas or potential for additional wear and tear on the vehicle. The superlative "best," therefore, cannot be disconnected from the stated objective. In this case, the "best" technology is given its proper context by

the phrase that follows it in the statute: *for minimizing adverse environmental impact.*[16]

Next, the United States argues that the preposition "for" is "sometimes used to indicate appropriateness or suitability," *EPA Br.* at 16 (quoting *American Heritage Dictionary* 686 (4th ed., 2006)). Petitioner relies, however, on the eighth listed definition in that source, as opposed to the first listed definition, *i.e.*, "to indicate the object, aim, or purpose of an action or activity." *Cf. American Trucking*, 531 U.S. at 466 (the Court rejected the second listed definition as "making no sense" in the context of section 109(b)(1) of the Clean Air Act). The United States also suggests that, had Congress used the word "at," the legislative intent to demand that the selected technology actually be the best technology would have been clear. By way of example, the Petitioner suggests that, "the best person *at* his trade might not be the best person *for* a particular job," *EPA Br.* at 16, but fails to acknowledge that the specifications of the particular job are relevant. For

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[16] Congress' use of this specific purpose-defining modifier in section 316(b) contrasts with statutory standards that Congress used elsewhere in the Act. For example, Congress directed EPA to establish effluent limitations for toxic pollutants that reflect "best available technology economically achievable." CWA § 301(b)(2)(A), 33 U.S.C. § 1311(b)(2)(A). The words "economically achievable" modify the phrase "best available technology," giving that phrase a different meaning, one that expressly includes cost considerations. In stark contrast, the modifying language in section 316(b) focuses on minimizing environmental impact, not on costs.

example, if a particular job calls only for a person with superior skills *for* repairing shoes, then the best cobbler *at* his trade would also be the best person *for* the job. If, however, the job calls for a cobbler who also has good "people skills," then a cobbler with poor "people skills" may not be the best person *for* the job even if he is the best *at* his trade. By detaching the preposition from the legislative objective, however, Petitioner again provides an example that is inapplicable in the context of section 316(b), because Congress did specify the objective.[17] The use of "at" or "for" in this context, therefore, is a distinction without a difference.

In addressing the term "available," the United States suggests that just because a luxury item is available does not mean that the cost is justified or that it would be purchased. That would be true if the person were not *required* to obtain the item. Section 316(b), by contrast, *requires* the minimization

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[17] Relying also on *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784 (6th Cir. 1995), to further its example, the United States quotes the Sixth Circuit explaining that "the requirement that EPA choose the 'best' technology does not mean that the chosen technology must be the best pollutant removal." *BP Exploration*, 66 F.3d at 796. The standard at issue in *BP Oil* was the best available technology standard under section 301(b)(2)(A). As discussed above, this standard for non-conventional effluent requires that the best available technology also be economically achievable. In this context, the Sixth Circuit's dicta, conveys only the obvious – the best technology does not necessarily have to be the best at pollutant removal if the best at pollutant removal is not also economically achievable.

of adverse environmental impact on an aquatic ecosystem. Congress directed that the selected technology be the best for accomplishing that objective. Relying on an example that disputes the "availability" of a luxury item on the basis of its affordability misses the mark. Moreover, the question presented in this case is not whether costs may be considered at some secondary level in determining "availability." The question is whether EPA may elevate cost considerations to the forefront of its technology evaluation by relying on a cost-benefit analysis.

The United States also proposes a definition of "minimize" that does not withstand scrutiny. Departing from the definition that EPA itself has used over the past three decades, the United States cites a single source to justify its argument that "in common usage, the terms "minimal" and "minimize" often refer to a lesser degree of reduction." *EPA Br.* at 17.[18] But as discussed above, EPA applied the most natural definition of "minimize" – "to reduce to the smallest extent" – when it first promulgated intake structure rules in 1976, and more recently when it promulgated the Phase I Rule governing intake structures at new facilities.

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[18] *MCI Telecommunications Corp. v. Am. Tel. & Tel.*, 512 U.S. 218, 226 (1994) (When the Court spoke of alternative dictionary definitions in *Nat'l R.R. Passenger Corp. v. Boston & Maine Corp.*, 503 U.S. 407, 418-419 (1992), "it did not refer to what we have here: one dictionary whose suggested meaning contradicts virtually all others.").

Moreover, the "risk assessment" example that the United States gives is inapposite. The United States relies on the following example:

> [I]f a person said that he was trying to minimize the risk of being hit by a car while crossing a street, he presumably would not mean that he was staying inside his house at all times. Instead the person would presumably mean that he was trying to *reduce that risk* consistent with other practical considerations, including economic ones such as the need to travel to work.

EPA Br. at 17-18 (emphasis added).

That analogy is flawed because its very premise is that the person is engaged in a risk assessment. The *best technology available for minimizing adverse environmental impact* determination required by section 316(b) does not, however, mandate a risk assessment; it mandates minimizing the known adverse impact. If, for example, a pedestrian had to cross Interstate 95 to travel to work, the pedestrian, undoubtedly, would do more than simply look both ways before crossing to minimize the greater likelihood that she could be injured or killed given the nature of the road she was trying to cross. The pedestrian would likely use every precautionary measure available to her to reduce to the smallest possible degree the likelihood that she could be struck by a car.

In other words, when trying to assess whether protecting society from an uncertain risk is worth the cost of regulating, a cost-benefit analysis may be a central consideration, but where the impact is certain and the cost of minimizing it necessary, cost is not necessarily a factor for consideration at all. When a person says, "minimize impact X," the only natural meaning of that statement is to "reduce" impact X "to the smallest possible number, degree, or extent." *Webster's Third*, at 1438. For this reason, EPA's example and its reliance on Hon. Justice Breyer's book, *Breaking the Vicious Circle: Toward Effective Risk Regulation*, are misplaced. *See EPA Br.* at 14 and 18.

Thus, Congress' decision in section 316(b), not to refer to costs, or costs in relation to benefits, was not an oversight, nor can it be construed as ambiguous silence. It was deliberate subordination of cost considerations to an emphasis on minimizing environmental impact.

B. Throughout the Clean Water Act, Congress Told EPA When and How It Could Consider Costs.

In making a threshold determination under *Chevron*, the Court should not "confine itself to examining a particular provision in isolation," but should follow the "fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the

overall statutory scheme." *Nat'l Ass'n of Home Builders v. Defenders of Wildlife*, 127 S.Ct. 2518, 2534 (2007) (quoting *Brown & Williamson*, *supra*, 529 U.S. at 132-133). Congress' direction as to when and how EPA could consider costs in sections 301 and 306 of the Act confirms that EPA cannot balance costs with benefits when selecting the best technology under section 316(b).

As a preliminary matter, the express reference in section 316(b) to sections 301 and 306 of the Act is not a cross reference inviting EPA to apply the same technology standards for discharges set forth in those sections. Section 316(b) provides that "[a]ny standard established pursuant to [33 U.S.C.] section 1311 [section 301] of this title, or [33 U.S.C.] section 1316 [section 306] and applicable to a point source" shall require cooling water intake structures to reflect *best technology available for minimizing adverse environmental impact.* By the United States' own admission, "the only direct consequence of the cross-reference is a procedural one: when any standard under section 301 or 306 is made applicable to a point source with an intake structure," the standard must also reflect the *best technology available for minimizing adverse environmental impact. EPA Br.* at 19. The reference in section 316(b) to sections 301 and 306, therefore, means only that when EPA promulgates or revises effluent limitations for existing facilities under section 301, or for new facilities under section 306, it must also include national requirements for cooling water intake

structures. Moreover, section 316(b) does not reference section 304, where the enumerated factors for the technology standards for existing facilities are found. *See* R.A. (chart comparing the factors Congress directed EPA to consider when selecting the *best technology available for minimizing adverse environmental impact* under section 316(b), with the factors EPA must consider when setting effluent limitations standards for other pollutant discharges under sections 301 and 306 of the CWA, or when justifying a variance from thermal discharge limitations under section 316(a)).

A review of the technology standards for discharges does, however, assist in understanding the role of costs in the determination of *best technology available for minimizing adverse impact*. Congress decided to provide different standards for different types of pollutants and facilities, and expressed its view of when and how EPA should consider technology costs when applying those statutory standards. It used different technology phrases throughout section 301 and then in section 306, with specific modifying language – "practicable technology," "conventional technology," and "technology economically achievable" – and intended to give each standard different meaning in its application. In some cases, Congress required EPA to consider cost in relation to environmental benefit. In other instances, Congress told EPA to consider cost as a factor, but not in relation to environmental benefit. CWA § 304(b), 33 U.S.C. § 1314(b). But in none of the

other technology standards in sections 301, 304, and 306 did Congress – as it did in section 316(b) – altogether omit any reference to cost. *See* R.A. This striking contrast between section 316(b) and the Act's technology standards for discharges provides powerful confirmation that Congress did not intend EPA to undertake a cost-benefit analysis when selecting the *best technology available for minimizing adverse environmental impact.*

Under section 301, EPA was initially required to establish effluent limitations for existing industrial facilities that required best practicable control technology ("BPT"), which standards the facilities were required to meet before 1989. CWA § 301(b)(1)(A), 33 U.S.C. § 1311(b)(1)(A). In setting BPT, Congress required EPA to consider the "total cost of application of technology in relation to effluent reduction benefits to be achieved from such application," and the age of the equipment and facilities involved, the process employed, engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impacts, energy requirements, and other factors EPA deems appropriate. CWA § 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B). Since 1989, existing facilities have been required to comply with more stringent effluent limitations for most toxic pollutants, including thermal pollution, that reflect the best available technology economically achievable ("BAT"). CWA § 301(b)(2)(A), 33 U.S.C. § 1311(b)(2)(A). In transitioning from BPT to BAT, Congress directed

that "in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits" of eliminating the discharge of pollutants. *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71 (1980) (discussing CWA § 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B)).

For new facilities, required to meet the more stringent standard "best available demonstrated technology" ("BADT"), EPA was directed again, as with BAT, to only consider the cost of achieving the reduction.[19] CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1); CWA § 304(b)(4)(B), 33 U.S.C. § 1314(b)(4)(B). In fact, the reference in section 316(b) to section 306 (the section applicable to new rather than existing facilities) confirms Congress' intent to eliminate EPA's authority to make cost-benefit comparisons when it sets new source performance standards. Consistent with its technology-forcing approach, Congress did not direct EPA to consider the value of the benefits to the receiving water body at all when promulgating BADT regulations. *Id.; See* R.A.

For conventional pollutants, under a provision added to the Act in 1977, existing facilities must comply with effluent limitations that reflect "best conventional pollutant control technology" ("BCT").

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[19] The CWA requires EPA to revise its regulations periodically, with respect to both new and existing facilities, to reflect advances in technology. *See, e.g.*, CWA § 304(b), 33 U.S.C. § 1314(b); CWA § 306(b)(1)(B), 33 U.S.C. § 1316(b)(1)(B).

CWA § 301(b)(2)(E), 33 U.S.C. § 1311(b)(2)(E). In setting BCT, like BPT, Congress directed EPA to consider costs in relation to benefits. CWA § 304(b)(4)(B), 33 U.S.C. § 1314(b)(4)(B). *See* R.A. Petitioners argue that because Congress has authorized EPA to continue to compare costs with benefits when it establishes BCT effluent limitations for conventional pollutants, such as BOD, fecal coliform, total suspended solids, pH, oil and grease, Congress has also evinced an unambiguous intent to allow EPA to compare costs with benefits under section 316(b). *EPA Br.* at 24-25. But Congress' express enumeration of a cost-benefit comparison factor for BCT five years after it enacted section 316(b) only confirms that Congress made deliberate choices about when EPA was to consider costs in relation to benefits, and when it could not.

In section 316(b), Congress imposed on EPA the single, unique mandate of requiring both new and existing facilities to apply *best technology available for minimizing adverse environmental impact* associated with intake structures. This Court has refused to find implicit authorization of certain factors where Congress has been explicit elsewhere in the same statute. *See, e.g., American Trucking*, 531 U.S., *supra*, at 467. Congress did not authorize EPA to set national standards based on cost-benefit analysis.

Congress' intent to preclude cost-benefit analysis in regulating intake structures is further shown by examining section 316(a). In that provision, Congress

also does not allow for consideration of cost, even when operators of a point source apply for a variance from the otherwise-applicable effluent limitation. Instead, a variance is authorized only when the standards "are more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" in and on a particular water body. CWA § 316(a), 33 U.S.C. § 1326(a). As in section 316(b), the impact on fish and wildlife is the paramount concern.

Even the United States acknowledges that Congress made deliberate choices about when EPA may use cost-benefit comparisons and when it may not. *EPA Br.* at 19 ("Congress *specified* the factors that EPA must consider in promulgating each of the various "best" standards found in sections 301 and 306. In doing so, it *expressly required* consideration of costs for all of those standards, and *specifically required* consideration of the relationship between costs and benefits for two of them.") (emphasis added); *see also EPA Br.* at 21 ("The bottom line is that each of the cross-referenced provisions requires consideration of costs, and two of them (BPT and BCT) *specifically require* comparison of costs and benefits.") (emphasis added). In marked contrast, section 316(b) expressly requires that EPA choose a technology that minimizes environmental impact, and does not authorize EPA to consider cost in relation to benefits.

C. The Legislative History Supports the Conclusion that Congress Rejected a Cost-Benefit Analysis in Section 316(b).

The legislative history of section 316(b) is sparse and undeserving of any significant weight. What little there is, however, supports the conclusion that the meaning of section 316(b) is plain on its face. In the House Consideration of the Report of the Conference Committee (Oct. 4, 1972) on the final version of the 1972 CWA Amendments, Representative Clausen explained the meaning of section 316(b) by using the language of section 316(b) itself, stating that "[s]ection 316(b) requires the location, design, construction and capacity of cooling water intake structures of steam-electric generating plants to reflect the best technology available for minimizing any adverse environmental impact." Congressional Research Service, "*A Legislative History of the Water Pollution Control Act Amendments of 1972, Vol. 1*," 93d Cong., 1st Sess., p. 264 ("Legislative History").

Petitioners, however, place a great deal of weight on Representative Clausen's one sentence remark in which he suggested that the word "available" means "commercially available at an economically practicable cost." This lone statement acts as the springboard for Petitioners' sometimes alternative argument that a cost-benefit analysis is unambiguously allowed by the "plain meaning" of section 316(b). This remark is undeserving of such weight. *See Chrysler Corp. v. Brown,* 441 U.S. 281, 311 (1979) ("[T]he remarks of a single legislator, even

the sponsor, are not controlling in analyzing legislative history."); *Consumer Product Safety Comm'n v. GTE Sylvania, Inc.*, 447 U.S. 102, 118 (1980). But even this single statement underscores the point that "availability" does not involve the weighing of cost with benefits, even in Representative Clausen's mind, since he did not define the word that way; rather, he defined the word "available" in terms of "practicability." *See States' Br., supra* at 18 (definition of "practicable").

The legislative history of sections 301, 304, and 306 also supports the literal reading of section 316(b) because it establishes that Congress did not intend to allow EPA to conduct a cost-benefit analysis in setting any of the "best technology" standards where "availability" was also a component. Specifically, the legislative reports accompanying the 1972 amendments to the CWA confirm that Congress intended a cost-benefit consideration to be made only during the transitional period before 1989 when establishing the effluent limitations under the BPT standard.[20] For example, in the 1972 Senate Consideration of the Report of the Conference

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[20] The BCT standard, the only other provision directing EPA to consider the relationship between costs and benefits, was not added to the CWA until 1977. *See* 3 *Legislative History of the Clean Water Act of 1977 – A Continuation of the Legislative History of the Federal Water Pollution Control Act Amendments of 1972*, at 427 (Committee Print compiled for the Senate Committee on Public Works by the Library of Congress), Sen. No. 95-14 (1975) (Statement of Senator Muskie).

Committee, the Chairman and the principal sponsor of the Senate Bill, Senator Edmund Muskie, discussed the difference between BPT to comply with section 301(b)(1)(A) and BAT to comply with section 301(b)(2)(A) of the Act:

> In making the determination of [BAT] for a category or class, the Administrator is expected to apply the same principles involved in making the determination of [BPT], *except as to cost-benefit analysis*. Also, rather than establishing the range of levels in reference to the average of the best performers in an industrial category, the range should, at a minimum, be established with reference to the *best performer in any industrial category*. The distinction between [BPT] and [BAT] is intended to reflect the need to press toward increasingly higher levels of control. . . .

Senate Consideration of the Report of the Conference Committee, 92d Congress, October 4, 1972, p. 170 (emphasis added), *reprinted in Legislative History of the Water Pollution Control Act Amendments of 1972* (Senate Public Works Comm.), Sen. No. 93-1 (1973).

Senator Muskie further elaborated on the limited way Congress intended the Administrator to consider cost in determining BAT:

> As to the cost of [BAT] – While cost should be a factor in the Administrator's judgment, *no balancing test will be required*. The Administrator will be bound by a test of

> reasonableness. In this case, the reasonableness of what is 'economically achievable' should reflect an evaluation of what needs to be done to move toward the elimination of the discharge of pollutants and what is achievable through the application of available technology – *without regard to cost*.

Id. (emphasis added).[21]

That Congress made deliberate choices about when to require cost-benefit considerations is further evidenced by the legislative history associated with section 316 generally. The Conference Committee Report for the CWA of 1972 explains that, while the House bill had proposed a version of section 316 that would have called for the altogether separate

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[21] The standard established in section 306(a)(1) is the most stringent effluent limitation standard in the CWA and does not allow for a comparison of costs and benefits. *See* Senate Consideration of the Report of the Conference Committee, 92d Congress, October 4, 1972 at 170, *reprinted in* 1 Legislative History of the Water Pollution Control Act Amendments of 1972 (Senate Public Works Comm.), Sen. No. 93-1 (1973). *See also* S. Rep. 92-414 (1971), *reprinted in* 1972 U.S.C.C.A.N. 3668, 3724 ("The implicit consideration of economic factors in determining whether technology is 'available' should not affect the usefulness of this section. The overriding purpose of this section would be to prevent new water pollution problems, and toward that end, maximum feasible control of new sources, at the time of their construction, is considered by the Committee to be the most effective and, in the long run, the least expensive approach to pollution control.").

regulation of thermal discharges, including a case-by-case variance based on a test involving a comparison of costs against benefits, the final bill, as modified by the Conference Committee, substituted the provision that was finally enacted as section 316(a). Section 316(a) provided that heat would be treated like any other pollutant, except for the creation of the limited variance specified in section 316(a). Notably, cost-benefit analysis was not included in any of the section 316 provisions. *See* Conference Committee Report No. 92-1236 (accompanying S. 2770) (Sept. 28. 1972) pp. 175 and 320 (CWA amendments 1972).

Reliance on a cost-benefit analysis, therefore, is inconsistent with Congress' intent, as confirmed by the legislative history, to eliminate the impact on the Nation's waters by requiring EPA to implement technology-forcing standards. Thus, in setting the national standard for cooling water intake structures, EPA must require that the technology achieve the desired end, and must not modify the desired end as a result of its consideration of the costs in relation to benefits to achieve that end.

The Petitioners, Entergy Corp. and PSEG Fossil ("Entergy"), mischaracterize the Second Circuit's construction of section 316(b), as pronouncing a "radical," "unsound," and "nonsensical" "clear statement rule." *Entergy Br.* at 21 and 24. Entergy inaccurately asserts "the Second Circuit concluded that cost-benefit analysis is prohibited unless explicitly authorized, *based solely on* this Court's statement in *American Textile* that 'when Congress

has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute.'" *Entergy Br.* at 24 (quoting *American Textile*, 452 U.S. at 510) (emphasis added). The Second Circuit's reading of section 316(b), however, was completely justified. Far from being "radical" or establishing a "clear statement rule," the Second Circuit's conclusion was reached using the basic tools of statutory construction. The court held only that Congress had set an unambiguous objective in section 316(b), one that is incompatible with the agency's cost-benefit approach when setting a national standard for Phase II facilities or addressing permits at a site-specific level. The Second Circuit's conclusion was not based solely on this Court's statement in *American Textile*, but was based on a thorough review of the text of section 316(b) itself, an examination of section 316(b) in relation to and in contrast to the other technology standards in the Act, legislative history, and the policy goals of the Act.

The Court therefore should reject Entergy's invitation to "adopt a presumption or clear statement rule that is the *opposite* of the one employed by the Second Circuit." *Entergy Br.* at 29 (emphasis in original). *See INS v. St. Cyr*, 533 U.S. 289, 320, n.45 (2001) (The cases and rules cited by Petitioner are distinguishable because "[w]e only defer, however, to agency interpretations of statutes that, applying the normal 'tools of statutory construction' are ambiguous."). In essence all of the Petitioners are asking the Court to presume ambiguity. Such a

presumption would allow agencies to second-guess Congress' intent even though the statutory language plainly indicates that Congress has already determined the relationship between the costs and benefits. Here, this Court should find that Congress deliberately precluded EPA from establishing standards for intake structures based on a cost-benefit analysis, and instead directed the minimization of environmental impact with the factor of cost as a subordinate consideration.

CONCLUSION

The judgment of the United States Court of Appeals for the Second Circuit should be affirmed.

Respectfully submitted,

PATRICK C. LYNCH
Attorney General of Rhode Island
TRICIA O'HARE JEDELE,
Counsel of Record
Special Assistant Attorney General
150 South Main Street
Providence, RI 02903
(401) 274-4400

(Additional Counsel Listed
On Inside Front Cover)

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ADDENDUM

CWA Statutory Provision For EPA to Establish National Technology-Based Standards	Factors EPA May Consider in Setting National Standard
Section 316(b), 33 U.S.C. § 1326(b) — Industry-wide intake structure standards for both new and existing facilities requiring application of *best technology available for minimizing adverse environmental impacts.*	Best technology available for minimizing adverse environmental impact.
Section 301(b)(1)(A), 33 U.S.C. §1311(b)(1)(A) — Pre-1989 Industry-wide technology standard for effluent discharges requiring application of *best practicable control technology* ("BPT") for existing power plants. Section 304(b)(1)(B), 33 U.S.C. § 1314(b)(1)(B) (listing factors).	"*[T]otal cost of application of technology in relation to effluent reduction benefits to be achieved from such application*," and "the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate." (emphasis added).
Section 301(b)(2)(A), 33 U.S.C. § 1311(b)(2)(A) — Post-1989 Industry-wide technology standard for non-conventional effluent discharges, including heat, requiring application of *best available technology economically achievable* ("BAT") for existing power plants. Section 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B) (listing factors).	"[T]he age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, *the cost of achieving such effluent reduction*, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate." (emphasis added).
Section 301(b)(2)(E), 33 U.S.C. § 1311(b)(2)(E) — Industry-wide technology standard applicable to discharges from existing facilities of conventional pollutants such as fecal coliform, total suspended solids, pH, oil and grease requiring *best*	*"[T]he reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from*

CWA Statutory Provision For EPA to Establish National Technology-Based Standards	Factors EPA May Consider in Setting National Standard
conventional pollutant control technology ("BCT"). Section 304(b)(4)(B), 33 U.S.C. § 1314(b)(4)(B) (listing factors).	*publicly owned treatment works to the cost and level of reduction of such pollutants* from a class or category of industrial sources," and "the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate." (emphasis added).
Section 306(a)(1) and (b)(1)(B), 33 U.S.C. § 1316(a)(1) and (b)(1)(B) — Industry-wide technology standard for effluent discharges from new sources of all pollutants requiring *best available demonstrated control technology* ("BADT").	"[F]or the control of the discharge of pollutants which reflects the *greatest degree of effluent reduction which the Administrator determines to be achievable* through application of the *best available demonstrated control technology*, processes, operating methods, or other alternatives, including where practicable, permitting no discharge of pollutants." "[T]he Administrator shall take into consideration *the cost of achieving such effluent reduction*, and any non-water quality, environmental impact and energy requirements." (emphasis added).

RESPONDENT'S BRIEF

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Nos. 07-588, 07-589 and 07-592

In the Supreme Court of the United States

ENTERGY CORPORATION, PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

PSEG FOSSIL LLC, ET AL., PETITIONERS

v.

RIVERKEEPER, INC., ET AL.

UTILITY WATER ACT GROUP, PETITIONER

v.

RIVERKEEPER, INC., ET AL.

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

BRIEF FOR THE FEDERAL PARTIES AS RESPONDENTS SUPPORTING PETITIONERS

GREGORY G. GARRE
Acting Solicitor General
Counsel of Record
RONALD J. TENPAS
Assistant Attorney General
EDWIN S. KNEEDLER
Deputy Solicitor General
DARYL JOSEFFER
Assistant to the Solicitor General
DAVID S. GUALTIERI
CYNTHIA J. MORRIS
JESSICA O'DONNELL
Attorneys
Department of Justice
Washington, D.C. 20530-0001
(202) 514-2217

PATRICIA K. HIRSCH
Acting General Counsel
RICHARD T. WITT
Attorney
Environmental Protection Agency
Washington, D.C. 20460

QUESTION PRESENTED

Whether Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the Environmental Protection Agency to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

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OPINION BELOW

The opinion of the court of appeals (Pet. App. 1a-94a) is reported at 475 F.3d 83.[1]

[1] Citations to the Pet. App. refer to the appendix filed in No. 07-588.

JURISDICTION

The judgment of the court of appeals was entered on January 25, 2007. A petition for rehearing was denied on July 5, 2007 (Pet. App. 95a-96a). On September 25, 2007, Justice Ginsburg extended the time within which to file the petitions for a writ of certiorari to and including November 2, 2007, and the petitions were filed on that date. The jurisdiction of this Court rests on 28 U.S.C. 1254(1).

STATUTORY AND REGULATORY PROVISIONS INVOLVED

The pertinent statutory and regulatory provisions are set forth in an appendix to this brief. App., *infra*, 1a-24a.

STATEMENT

1. Steam electric power plants and other industrial and manufacturing facilities depend upon intake structures to withdraw water from the Nation's lakes, rivers, and other water bodies. The withdrawn water then absorbs heat from the steam used to generate electricity. Among the adverse environmental impacts associated with the use of intake structures are "impingement," which occurs when aquatic organisms are trapped against the structures by the force of inflowing water, and "entrainment," which occurs when smaller organisms are pulled into a facility's cooling system. Billions of aquatic organisms are impinged or entrained by intake structures annually. See Pet. App. 3a.

Section 316(b) of the Clean Water Act (CWA or Act), 33 U.S.C. 1251 *et seq.*, requires that "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for mini-

mizing adverse environmental impact." 33 U.S.C. 1326(b). That provision is unique among CWA provisions because it addresses the *intake* of water, in contrast to other provisions that regulate the *discharge* of pollutants into waters of the United States.

The CWA does not define the substantive standard specified in Section 316(b)—"best technology available for minimizing adverse environmental impact" (BTA). 33 U.S.C. 1326(b). Section 316(b) does, however, cross-reference Sections 301 and 306 of the CWA by specifying that standards established pursuant to those sections must require that intake structures reflect BTA, *ibid.*, and Sections 301 and 306, in turn, call for consideration of costs.

Section 301 requires the Environmental Protection Agency (EPA) to establish standards known as "effluent limitations" for *existing* point source discharges in two phases. In the first phase, applicable to all pollutants, EPA must establish effluent limitations based on the "best practicable control technology currently available" (BPT). 33 U.S.C. 1311(b)(1)(A). In establishing BPT, EPA must consider a number of specified factors, including "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application," as well as "such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(1)(B).

In the second phase, EPA must establish effluent limitations for conventional pollutants based on the "best conventional pollution control technology" (BCT), and for toxic pollutants based on the "best available technology economically achievable" (BAT). 33 U.S.C. 1311(b)(2)(A), (E). In determining BCT, EPA must consider, *inter alia*, "the relationship between the costs of

attaining a reduction in effluents and the effluent reduction benefits derived" and "such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(4)(B). In determining BAT, EPA must consider, *inter alia*, "the cost of achieving such effluent reduction" and "such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(2)(B).

Section 306 directs EPA to establish performance standards for *new* sources based on the "best available demonstrated control technology" (BADT). 33 U.S.C. 1316(a)(1). In establishing BADT, EPA "shall take into consideration the cost of achieving such effluent reduction, and any non-water quality, environmental impact and energy requirements." 33 U.S.C. 1316(b)(1)(B).

The limitations and standards promulgated under Sections 301, 306, and 316(b) are implemented through National Pollutant Discharge Elimination System (NPDES) permits. Such permits are issued for terms of up to five years, either by States with approved NPDES programs or by EPA in States without such programs. See 33 U.S.C. 1342; 40 C.F.R. 125.90(a).

2. a. EPA first promulgated regulations implementing Section 316(b) in 1976. J.A. 38-49 (41 Fed. Reg. 17,387). In the preamble to those regulations, EPA stated that, while Section 316(b) does not "require" the agency to conduct a cost-benefit assessment, the agency would consider a technology's "economic practicality" for individual facilities on a case-by-case basis. J.A. 42.

The Fourth Circuit remanded those regulations to EPA for procedural reasons. *Appalachian Power Co.* v. *Train*, 566 F.2d 451 (1977). When EPA subsequently withdrew the remanded regulations, it directed permitting authorities to use their best professional judgment to determine BTA for each facility on a case-by-case

basis. See 40 C.F.R. 401.14. In 1977, EPA distributed a draft guidance document that proposed a process for determining BTA on a facility-specific basis. See Pet. App. 160a-161a.

In 1977, EPA also issued a permitting decision and a General Counsel opinion explaining that it would not be "reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 and 2)*, No. 76-7, 1977 WL 22370 (June 10, 1977), remanded on other grounds, 572 F.2d 872 (1st Cir. 1978); accord *In re Central Hudson Gas & Elec. Corp., Op. EPA Gen. Counsel*, NPDES No. 63, 1977 WL 28250, at *8 (July 29, 1977). Thus, the framework in existence for more than 30 years has provided for permitting authorities to consider the relationship between costs and benefits to at least that extent in determining each facility's BTA on a case-by-case basis.

b. In 1995, EPA entered into a consent decree establishing deadlines for proposing and taking final action on regulations implementing Section 316(b). That consent decree was later amended to provide for three "phases" of rulemaking addressing different categories of facilities. See Pet. App. 6a.

EPA published a Phase I rule in 2001. 66 Fed. Reg. 65,256. That rule governs *new* facilities that meet certain threshold specifications, and it provides that closed-cycle recirculating cooling systems (which reuse withdrawn water) reflect BTA for such facilities. *Id.* at 65,270-65,271. The Second Circuit largely upheld the Phase I rule. *Riverkeeper, Inc.* v. *United States EPA*, 358 F.3d 174, 181 (2004) (*Riverkeeper I*). The Phase II rule, which is at issue here, establishes requirements for

intake structures at *existing* large power plants that meet certain criteria. Pet. App. 122a-593a (69 Fed. Reg. 41,576 (2004)). The Phase III Rule establishes requirements for new offshore and coastal oil and gas facilities, existing manufacturing and industrial facilities, and smaller power plants. 71 Fed. Reg. 35,006 (2006). That rule is under review in the Fifth Circuit, which stayed its proceedings pending this Court's disposition of this case. *ConocoPhillips Co.* v. *EPA*, No. 06-60662 (filed July 14, 2006).

c. In the Phase II rule at issue here, EPA selected a combination of technologies to reflect BTA for existing large power plants. Pet. App. 224a-225a. Those technologies include, among others, relocation of intakes, fine mesh passive screens, double-entry single-exit traveling screens, velocity caps, larger intakes to decrease intake velocity, and barrier nets. See *id.* at 228a. EPA selected those technologies based on the various options' "overall efficacy, availability, economic practicability, including economic impact and the relationship of costs with benefits, and non-water quality environmental impacts, including energy impacts." *Id.* at 253a.

Based on the chosen technologies, EPA established national performance standards for reducing impingement mortality (by 80%-95%) and entrainment (by 60%-90%). 40 C.F.R. 125.94(b). EPA did not, however, require the use of any specific technology, because it wanted to "provide[] a high degree of flexibility for existing facilities to select the most effective and efficient approach and technologies for minimizing adverse environmental impact associated with their cooling water intake structures." Pet. App. 226a.

EPA considered treating closed-cycle recirculating cooling systems, which it had determined to be BTA for

(new) Phase I facilities, as BTA for (existing) Phase II facilities. See Pet. App. 254a-261a. EPA rejected that alternative, however, because of its "generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations." *Id.* at 255a. EPA explained that: the cost of closed-cycle recirculating cooling towers for existing Phase II facilities was many times higher than for new Phase I facilities because of the need to retrofit facilities that had not been designed to use closed-cycle towers; such cooling towers were less energy efficient than EPA's chosen alternatives; and, "[a]lthough not identical, the ranges of impingement and entrainment reduction are similar" under EPA's chosen option and the closed-cycle alternative. *Id.* at 255a-261a; see *id.* at 368a-369a.

The rule also allows a facility to request a variance resulting in a site-specific BTA determination if the facility demonstrates that its cost of complying with the national performance standards is significantly greater than the environmental benefits. 40 C.F.R. 125.94(a)(5). EPA provided that flexibility because its "comparison of national costs to national benefits" underlying the nationwide performance standards "may not be applicable to a specific site due to variations in (1) the performance of intake technologies and (2) characteristics of the waterbody in which the intake(s) are sited." Pet. App. 250a.

3. After several parties petitioned for review, the petitions were consolidated in the Second Circuit. See Pet. App. 1a-94a. The court of appeals recognized that "Section 316(b) does not itself set forth * * * the specific factors that the EPA must consider in determining

BTA." *Id.* at 20a. Because Section 316(b) cross-references Sections 301 and 306, however, the court looked to the factors that EPA must consider in implementing various standards under those sections. *Id.* at 20a-23a. While those standards treat costs in different ways, and two of them specifically require a comparison of costs and benefits, the court concluded that Congress had manifested a clear intent in those other provisions "to move cost considerations under the CWA from a cost-benefit analysis to a cost-effectiveness one." *Id.* at 22a. The court further asserted that, if Congress had intended to permit a comparison of costs and benefits under Section 316(b), it would have said so expressly in the statute. *Id.* at 25a.

The court of appeals then held that EPA may not engage in cost-benefit analysis, but instead "may permissibly consider cost in two ways: (1) to determine what technology can be 'reasonably borne' by the industry and (2) to engage in cost-effectiveness analysis." Pet. App. 26a. After consulting the definition of "cost-effectiveness" found in an Office of Management and Budget (OMB) circular that does not purport to implement the CWA, the court explained that, in its view, permissible cost-effectiveness review is limited to choosing "a less expensive technology that achieves essentially the same results" as the best technology that industry can reasonably bear. *Id.* at 23a n.10, 26a-28a. "For example, assuming the EPA has determined that power plants governed by the Phase II Rule can reasonably bear the price of technology that saves between 100-105 fish, the EPA, given a choice between a technology that costs $100 to save 99-101 fish and one that costs $150 to save 100-103 fish * * *, could appropriately choose the cheaper technology on cost-effectiveness grounds." *Id.*

at 26a-27a. Thus, the court concluded, "the specified level of benefit is * * * a narrowly bounded range, within which the EPA may permissibly choose between two (or more) technologies that produce essentially the same benefits but have markedly different costs." *Id.* at 28a.

The court of appeals then remanded to EPA because, in the court's view, "it is unclear whether the Agency improperly weighed the benefits and the costs of requiring closed-cycle cooling." Pet. App. 32a-33a. Based on its cost-benefit holding, the court also invalidated a provision of the Phase II rule that authorizes site-specific variances for facilities where costs of compliance with the nationwide performance standards would significantly exceed the environmental benefits. *Id.* at 56a-60a. On the same basis, the court rejected an industry petitioner's contention that the rule's costs impermissibly exceed its benefits. *Id.* at 27a n.13. While the court upheld EPA's authority to express BTA as a range, it also concluded that the agency must "require facilities to choose the technology that permits them to achieve as much reduction of adverse environmental impacts as is technologically possible," and the court directed EPA to reconsider its chosen ranges under that standard on remand. *Id.* at 43a-44a.

The court of appeals addressed a number of other challenges to the rule as well. For example, the court held that EPA had not provided sufficient public notice concerning a provision that authorizes the operator of a facility to apply for a site-specific BTA determination in circumstances where the facility's costs of complying with the nationwide performance standards would be significantly greater than the costs considered by EPA in establishing those standards. Pet. App. 51a-56a. The

court also upheld EPA's determinations that Section 316(b) applies to existing as well as new facilities, *id.* at 72a-77a, and that the loss of aquatic organisms is an adverse environmental impact within the meaning of Section 316(b), *id.* at 78a-80a.

SUMMARY OF ARGUMENT

The agency's gap-filling interpretation of Section 316(b) of the CWA is entitled to deference under *Chevron U.S.A. Inc.* v. *NRDC*, 467 U.S. 837 (1984). The CWA is full of requirements governing the *discharge* of pollutants, and in many instances Congress specified, in detail, the factors that EPA must consider in implementing those requirements. In Section 316(b), in contrast, Congress included a single terse sentence concerning the *intake* of water, and assigned broad authority to the agency to determine how best to address that distinct issue. The court of appeals erred by attempting to micro-manage the agency's exercise of its broad statutory discretion.

A. The CWA requires that "the location, design, construction, and capacity of cooling water intake structures reflect the *best* technology *available* for *minimizing* adverse environmental impact." 33 U.S.C. 1326(b) (emphases added). Nothing in that statutory standard speaks directly to the question whether, or to what extent, EPA should consider the relationship between costs and benefits. The "best" way for pursuing a goal is not always the one that most single-mindedly pursues that goal at all costs. Instead, the best way often depends on other considerations.

Moreover, whether a technology is "available" under Section 316(b) depends on its cost, as even the court of appeals acknowledged. And the term "minimizing" is

commonly used to refer to reductions that fall short of the greatest amount possible. Thus, the statutory standard does not unambiguously require EPA to set BTA without regard to the relationship between costs and benefits. Nor does it specify the extent to which EPA may consider that relationship. Instead, the Act leaves that determination to EPA—the agency with expertise in making such determinations.

B. Section 316(b) cross-references Sections 301 and 306 of the Act by specifying that standards established pursuant to those sections must require that intake structures reflect BTA. Those sections contain several "best" standards that govern the discharge of pollutants. Significantly, the Act expressly *requires* EPA to consider costs in promulgating all of those standards, and specifically requires EPA to consider the relationship between costs and benefits in promulgating two of them. Thus, while Section 316(b) sets forth a different standard than the "best" standards of Sections 301 and 306, and does not require EPA to follow those provisions as a model for determining BTA, the cross-reference to those provisions nonetheless suggests that EPA's consideration of the relationship between costs and benefits is at least reasonable.

Congress had good reason to confer greater discretion on the agency under Section 316(b) than under Sections 301 and 306. Section 316(b) is unique among the CWA's provisions in that it governs the *intake* of water, as opposed to the *discharge* of pollutants. Moreover, "Section 316(b) is something of an afterthought, having been added by the conference committee without substantive comment." *Riverkeeper I*, 358 F.3d at 186 n.12. Especially compared to the far more detailed provisions governing *discharge* limitations under Sections 301 and

306, Section 316(b)'s single sentence vests broad gap-filling authority in EPA to address the unique issue of *intake* restrictions.

C. The court of appeals' error is confirmed not only by the text, structure, and history of the statute, but also by the extent to which the court attempted to micromanage EPA's consideration of various factors. The court held that EPA could undertake what the court called "cost-effectiveness" but not "cost-benefit" analysis—terms that appear nowhere in Section 316(b). While the court ultimately acknowledged that the agency could consider the relationship between costs and benefits, it held that the agency could do so only within an unspecified but "narrowly bounded" range. Pet. App. 28a. And the court held that, while cost-benefit analysis is impermissible, consideration of energy efficiency is permissible. Nothing in Section 316(b)'s single, terse sentence unambiguously draws those distinctions; instead, the court effectively imposed its own preferences on the agency, in contravention of *Chevron*.

D. The court of appeals also turned normal rules of statutory construction and agency deference on their head by asserting that agencies *may* consider the relationship between costs and benefits only when Congress has *clearly* authorized them to do so. Under *Chevron*, if Congress has not directly spoken to the precise question at issue, the agency has leeway to adopt its own construction of the statute as long as it is reasonable. Thus, Congress's silence or ambiguity on an issue confers discretion, not limitation. In any event, the traditional interpretive principles discussed above make clear that, in this instance, Congress intended to confer especially *broad* discretionary authority on EPA.

E. The agency's measured consideration of costs and benefits in this rulemaking fell well within its discretion. Indeed, EPA's selection of a nationwide performance standard based on multiple relevant factors may be permissible even under the cramped standard created by the court of appeals. The agency found that the environmental respondents' preferred technology had similar benefits, but far higher costs, than the performance standards selected by EPA, and that other factors such as energy efficiency and air quality also weighed in favor of EPA's chosen performance standards. The agency further authorized a site-specific determination of BTA if a facility's costs of compliance with the nationwide performance standards would be significantly greater than the benefits. Especially considering that BTA was historically determined on a facility-specific, best-professional-judgment basis, and the site-specific provision looks only to whether costs *significantly* exceed benefits, that provision falls comfortably within EPA's discretion.

ARGUMENT

THE ENVIRONMENTAL PROTECTION AGENCY MAY CONSIDER COSTS IN RELATION TO BENEFITS IN DETERMINING THE BEST TECHNOLOGY AVAILABLE FOR MINIMIZING ADVERSE ENVIRONMENTAL IMPACT UNDER SECTION 316(b)

Consideration of the costs of a certain action in relation to its benefits is common in government regulation, as it is in human experience generally. In everyday life, people routinely weigh costs against benefits in deciding whether to do something. If a bigger car would be safer than a smaller and less expensive one, a person must decide whether the extra expense (of both the larger car

and the subsequent gasoline purchases) is justified by the safety and other benefits. Similarly, if a better home fire alarm would cost more than a traditional one, or if expensive new insulation would be more fire-resistant than the insulation already installed in a house, the homeowner must decide whether the added safety benefit justifies the added cost. See Hon. Stephen G. Breyer, *Breaking the Vicious Circle: Toward Effective Risk Regulation* 16 (1994) (*Vicious Circle*).

In numerous contexts, federal agencies engage in conceptually similar analyses by deciding whether a regulatory alternative's costs are justified by its benefits. To be sure, agencies do not always make cost-benefit analyses. And when they do such analyses, agencies consider costs and benefits in different ways, and give differing weight to costs and benefits. Sometimes costs and benefits are measured in monetary terms; other times they are compared qualitatively, as people do in everyday life. Sometimes an agency looks only at whether the benefits exceed the costs; other times (as here) the agency considers the cost-benefit relationship in conjunction with other factors. In the latter circumstance, after considering all relevant factors, an agency might decide to issue a regulation even though its costs are very high in proportion to its benefits. Or the agency might decide that the costs are too disproportionate to benefits to justify the proposal. But however an agency approaches the issue, consideration of costs and benefits is a common feature of agency decision-making, including in the environmental area.

The question presented here is not whether or to what extent cost-benefit analysis is a good thing. Instead, the question is whether Section 316(b) permits EPA to consider the relationship between costs and ben-

efits in determining the best technology available for minimizing the adverse environmental impact of cooling water intake structures. That question must be answered by applying the familiar two-step framework established by *Chevron*: first, "whether Congress has directly spoken to the precise question at issue"; and, if not, "whether the agency's answer is based on a permissible construction of the statute." 467 U.S. at 842-843. As explained below, Section 316(b) does not directly answer the question presented (or preclude EPA from considering the relationship between costs and benefits), and EPA's determination that it is appropriate to consider both costs and benefits in this context is an entirely permissible construction of the statute.

A. The Statutory Text Does Not Unambiguously Prohibit Consideration Of The Relationship Between Costs And Benefits

Section 316(b) requires that "the location, design, construction, and capacity of cooling water intake structures reflect the *best* technology *available* for *minimizing* adverse environmental impact." 33 U.S.C. 1326(b) (emphases added). That statutory standard does not directly speak to the question presented. Nor, to be clear, does it unambiguously preclude EPA from considering the relationship between costs and benefits—especially considering that Congress did not define any of the key statutory terms or otherwise specify the factors the agency may or must consider. See Pet. App. 20a ("Section 316(b) does not itself set forth * * * the specific factors that the EPA must consider in determining BTA.").

The first key statutory term is "best." Best is a relative term capable of different meanings, and the "best"

way of pursuing a goal is not always the one that most single-mindedly achieves that goal at all costs. For example, the best way to drive home might not be the quickest and most direct route on a map. That route might be more dangerous than others, more prone to traffic jams, or more expensive (*e.g.*, if it required payment of a toll). Similarly, the best way to win a game does not typically entail violating the rules, even if cheating would improve one's odds of winning, because other values matter as well. And the best way to catch fish is not necessarily the one that nets the most fish in the shortest period of time; to many, fly fishing has offsetting advantages.

Moreover, Section 316(b) refers to the "best technology available *for* minimizing adverse environmental impact," not the technology that is best *at* minimizing such impact. 33 U.S.C. 1326(b) (emphasis added). The word "for" is sometimes "[u]sed to indicate appropriateness or suitability." *American Heritage Dictionary* 686 (4th ed. 2006) (*American Heritage*); accord VI *Oxford English Dictionary* 26 (2d ed. 1989). Thus, while an individual may be regarded as the best person *at* his trade, he might not be the best person *for* a particular job, depending on a range of considerations. As the Sixth Circuit explained in construing another "best" standard in the CWA, the "requirement that EPA choose the 'best' technology does not mean that the chosen technology must be the best pollutant removal." *BP Exploration & Oil, Inc.* v. *United States EPA*, 66 F.3d 784, 796 (1995); accord *Citizens Coal Council* v. *United States EPA*, 447 F.3d 879, 903 (6th Cir. 2006) (en banc).

The statute also refers to the "best technology *available* for *minimizing* adverse environmental impact." 33 U.S.C. 1326(b) (emphases added). As the court of

appeals recognized, a technology's availability under Section 316(b) depends on its cost. Pet. App. 24a; see also *id.* at 349a-350a. The court erred, however, in holding that the statute unambiguously constrains EPA's consideration of costs to whether a technology's cost could be "reasonably borne by the industry." *Id.* at 24a. Even considering the term "available" in isolation, many people would not think of a luxury item as being "available" simply because its purchase would not bankrupt them. See *Random House Dictionary of the English Language* 142 (2d ed. 1987) (defining "available" to mean, among other things, "readily obtainable; accessible"); *American Heritage* 123 ("[p]resent and ready for use; at hand; accessible"). Indeed, assuming that the court of appeals did not intend to require a just-shy-of-bankruptcy standard, but instead intended the "reasonably borne" standard to be a more flexible one, that only underscores that Section 316(b)'s use of the term "available" does not unambiguously preclude consideration of whether an option's costs are warranted in light of other considerations.

The statutory term "minimizing" is also significant. To be sure, that term most formally refers to "reduc[ing] to the smallest possible amount, extent, size, or degree." *American Heritage* 1119. But in common usage, the terms "minimal" and "minimize" often refer to a lesser degree of reduction. See, *e.g.*, *ibid.*; *Black's Law Dictionary* 1016 (8th ed. 2004) ("smallest *acceptable* or possible quantity") (emphasis added). For example, if a person said that he was trying to minimize the risk of being hit by a car while crossing a street, he presumably would not mean that he was staying inside his house at all times. Instead, the person would presumably mean that he was trying to reduce that risk consis-

tent with other practical considerations, including economic ones such as the need to travel to work, and thus, for example, was looking both ways before crossing a street. Accordingly, EPA determined that the appropriate "degree" of minimization may depend in part on "the relationship between costs and benefits." Pet. App. 355a; see 40 C.F.R. 125.83 ("Minimize means to reduce to the smallest amount, extent, or degree *reasonably* possible.") (emphasis added).

The upshot is that the "best technology available for minimizing adverse environmental impact," 33 U.S.C. 1326(b), is not unambiguously the one that achieves the greatest degree of environmental protection without regard to other considerations, including the relationship between costs and benefits. If it did, EPA might have to require a facility to devote billions of dollars to saving a relatively small number of organisms, even if those billions might be far better spent in other ways, including on more beneficial environmental objectives. Cf. *Vicious Circle* 18-19. Nothing in the statutory text compels that result.

B. The Statutory Structure, Context, And History Confirm That EPA May Consider The Relationship Between Costs And Benefits

Section 316(b) does not define its key terms or set forth the factors that EPA must or may consider in determining BTA. It does, however, cross-reference Sections 301 and 306 of the CWA by specifying that standards established pursuant to those sections, which govern the discharge of pollutants, must require that intake structures reflect BTA. 33 U.S.C. 1326(b). The only direct consequence of the cross-reference is a procedural one: when any standard under Section 301 or 306

is made applicable to a point source with an intake structure, such as in an NPDES permit, the standard must also reflect BTA limits. Cf. Pet. App. 5a. Nonetheless, the cross-reference to Sections 301 and 306 is informative, especially because those sections include numerous other "best" standards. See *id.* at 6a, 20a; *Riverkeeper I*, 358 F.3d at 186; Pet. App. 154a, 349a-350a.

As discussed below, Congress specified the factors that EPA must consider in promulgating each of the various "best" standards found in Sections 301 and 306. In doing so, it expressly *required* consideration of costs for all of those standards, and specifically *required* consideration of the relationship between costs and benefits for two of them. The express statutory mandate to consider costs under the cross-referenced sections strongly supports EPA's interpretation that consideration of the relationship between costs and benefits is *permissible* under Section 316(b). Moreover, Congress's decision to specify the factors that EPA must consider under the "best" standards for the discharge of pollutants under Sections 301 and 306, but not under the different "best" standard for the intake of water under Section 316(b), confirms that Congress intended to grant broad discretion to the agency to interpret and implement Section 316(b)'s terse and unique provision.

1. Section 316(b) cross-references provisions that require consideration of costs, including comparison of costs and benefits

The cross-referenced Section 301 directs EPA to promulgate "effluent limitations for point sources * * * which shall require the application of the best practicable control technology currently available" (BPT). 33 U.S.C. 1311(b)(1)(A). Congress specified that, in es-

tablishing BPT, EPA *must* consider, among other factors, "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." 33 U.S.C. 1314(b)(1)(B). Determination of BPT, therefore, requires "weighing benefits and costs." *EPA* v. *National Crushed Stone Ass'n*, 449 U.S. 64, 76 (1980).

While the BPT standards were to provide the first effluent limitations for all pollutants, Congress directed EPA to promulgate more stringent effluent limitations thereafter. *National Crushed Stone*, 449 U.S. at 69-70 & n.9. For conventional pollutants, Congress required EPA to promulgate effluent limitations based on the "best conventional pollution control technology" (BCT). 33 U.S.C. 1311(b)(2)(E); see 33 U.S.C. 1314(a)(4) (granting EPA authority to identify conventional pollutants); see also *National Crushed Stone*, 449 U.S. at 70 n.9. In determining BCT, EPA must consider, among other factors, "the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. 1314(b)(4)(B). Thus, Congress again expressly required consideration of the relationship between costs and benefits. See, *e.g.*, *American Paper Inst.* v. *United States EPA*, 660 F.2d 954, 961 (4th Cir. 1981).

For toxic and some other non-conventional pollutants, Congress required limitations that "require application of the best available technology economically achievable * * * which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants" (BAT), unless EPA determines that the complete elimination of pollutant discharges is "technologically and economically achievable" for a category or class of point sources. 33 U.S.C.

1311(b)(2)(A), (C), (D), (F); see 33 U.S.C. 1362(13) (defining the term "toxic pollutant"); see also *National Crushed Stone*, 449 U.S. at 70-71. In the latter situation, EPA is to require the elimination of such discharges. 33 U.S.C. 1311(b)(2)(A). Congress specified that, in promulgating BAT standards, EPA "shall take into account" a number of factors, including "the cost of achieving such effluent reduction * * * and such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(2)(B). Congress further authorized EPA to promulgate standards less stringent than BAT, but at least as stringent as BPT, for certain non conventional pollutants. See 33 U.S.C. 1311(g).

While the various Section 301 standards govern *existing* sources, Section 306 requires EPA to promulgate standards of performance for *new* sources. 33 U.S.C. 1316(b)(1)(B). Those standards must "reflect the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants" (BADT). 33 U.S.C. 1316(a)(1). In establishing BADT, EPA "shall take into consideration the *cost* of achieving such effluent reduction, and any non-water quality, environmental impact and energy requirements." 33 U.S.C. 1316(b)(1)(B) (emphasis added).

The bottom line is that each of the cross-referenced provisions *requires* consideration of costs, and two of them (BPT and BCT) specifically require comparison of costs and benefits. Section 316(b)'s cross-reference to those provisions therefore reinforces the conclusion that it does not unambiguously *preclude* EPA from consider-

ing the relationship between costs and benefits. Pet. App. 345a-350a. Indeed, considering that standards established pursuant to Sections 301 and 306 must require that intake structures reflect BTA, and that all of the relevant standards and limitations are set forth in the same NPDES permit for a facility, see 33 U.S.C. 1326(b), it would make little sense for EPA to have less flexibility in determining BTA than in determining the other standards.

2. Congress conferred broad authority on EPA to determine how best to consider costs, benefits, and other relevant factors

a. Especially measured against the detailed provisions governing the factors that EPA must consider in promulgating effluent limitations under Sections 301 and 306, the single sentence set forth in Section 316(b) confers broad authority on the agency to determine both which factors to consider and how to consider them. Section 316(b) sets forth a different standard (BTA) than the other sections. And nothing in the Act evinces an intent to require EPA to treat BTA like—or differently than—any one of the Section 301 or 306 effluent limitations. Nor does Section 316(b) evince any intent to require EPA to consider only the factors listed in one or another of those sections, or to consider any given factor in precisely the same manner that it considers that factor in determining another of the "best" standards. Instead, as the Second Circuit itself observed in *Riverkeeper I*, the fact that Congress set forth lists of factors that EPA must consider in implementing the various "best" standards of Sections 301 and 306, but conspicuously did not do so in Section 316(b), confirms the

breadth of the discretion left to EPA. 358 F.3d at 187; see Pet. App. 156a-157a.

b. Congress had good reason to confer greater discretion on EPA under Section 316(b) than under Sections 301 and 306. Section 316(b) is unique among the CWA's provisions in that it governs the *intake* of water, as opposed to the *discharge* of pollutants. Because "intake structures are in a class by themselves," *Riverkeeper I*, 358 F.3d at 193, there is no reason to presume that the same standards that govern the discharge of pollutants should also govern the intake of water. Indeed, as the court of appeals observed, "Section 316(b) is something of an afterthought, having been added by the conference committee without substantive comment." *Id.* at 186 n.12. Thus, as the Second Circuit explained in *Riverkeeper I*, the "brevity" of Section 316(b), combined with the "paucity of legislative history, when measured against the volumes of drafts and speeches devoted to other aspects of the 1972 amendments," suggests that Congress "desire[d] to delegate significant rulemaking authority to the Agency." *Ibid.*

Moreover, what little legislative history there is supports EPA's interpretation. A legislator explained that "[t]he reference here to 'best technology available' is intended to be interpreted to mean the best technology available commercially *at an economically practicable cost.*" 118 Cong. Rec. 33,762 (1972) (statement of Rep. Clausen) (emphasis added). Even the court of appeals acknowledged that "practicable" connotes cost-benefit considerations. Pet. App. 30a-31a.

c. The court of appeals relied on what it believed to be a clear intent on the part of Congress to abolish cost-benefit analysis after 1989 because, in the court's view, EPA may not undertake such analysis in determining

either BAT or BADT, and BAT replaced BPT in 1989. Pet. App. 20a-23a. As discussed above, Congress set forth lists of factors that EPA "shall" consider in determining BAT and BADT. 33 U.S.C. 1314(b)(1)(B); 33 U.S.C. 1316(b)(1)(B); see pp. 19-21, *supra*. Without explanation, the court of appeals treated those lists as setting forth the only factors that EPA "could consider." Pet. App. 21a. That interpretation is contradicted by the statute itself with respect to BAT, because Section 304(b)(2)(B), after identifying certain specific factors that EPA "shall" take into account, also authorizes consideration of "such other factors as the Administrator deems appropriate." 33 U.S.C. 1314(b)(2)(B).

Assuming for the sake of argument that cost-benefit analysis is not one of the other factors that EPA may consider in determining BAT, however, the court of appeals' conclusion does not follow. Cf. *National Crushed Stone*, 449 U.S. at 71. Even if no Section 301 or 306 effluent limitations could be based in part on cost-benefit analysis after 1989, that would manifest only an intent to preclude cost-benefit analysis for *discharge* limitations under Sections 301 and 306; it would not unambiguously reflect an intent to preclude cost-benefit analysis for *intake* limitations under the different Section 316(b) standard.

Moreover, the court of appeals erred in assuming that all Section 301 effluent limitations after 1989 are BAT limitations. As discussed above, the BAT standard is inapplicable to conventional pollutants, which are generally governed instead by the BCT standard. 33 U.S.C. 1311(b)(2)(E). In determining BCT, EPA must consider "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. 1314(b)(4)(B).

If the incremental costs of more stringent technologies are not reasonable in light of their incremental benefits, EPA will set BCT effluent limitations at the BPT level. 51 Fed. Reg. 24,976 (1986). Thus, since 1989, EPA has continued to adopt BPT standards for some conventional pollutants. See *Chemical Mfrs. Ass'n* v. *United States EPA*, 870 F.2d 177, 206-207 (5th Cir.), decision clarified on reh'g by 885 F.2d 253 (1989), cert. denied, 495 U.S. 910 (1990). And Congress authorized EPA to set effluent limitations for certain non-conventional pollutants at a level less stringent than BAT but at least as stringent as BPT. 33 U.S.C. 1311(g). The court of appeals therefore erred in assuming that the BAT standard governs all Section 301 effluent limitations after 1989.

Nor is there any basis for the court of appeals' conclusion that the Act unambiguously requires EPA to treat BTA as being more equivalent to BAT and BADT than to BPT. The court of appeals stated that BTA is "linguistically similar" to BAT but not BPT. Pet. App. 23a. But BTA, BPT, and BAT all include the terms "best," "technology," and "available," and neither BPT nor BAT goes on to consider minimizing adverse environmental impacts, as BTA does. See 33 U.S.C. 1311(b)(1)(A) and (2)(A). The court of appeals suggested that the BPT standard is inapposite because the word "practicable" appears in BPT but not BTA. Pet. App. 31a. One could argue with equal force, however, that BAT is inapposite because the phrase "economically achievable" appears in BAT but not BTA. Accordingly, the court of appeals erred in concluding that the Act unambiguously treats BTA like BAT (but not BPT) for this purpose. The only sensible conclusion one can draw from the differences in jargon used by Congress is that all of the different "best" standards are indeed different

and susceptible to differing interpretations in their own right, such that none of the others controls the meaning of BTA.

The BADT standards promulgated under Section 306 provide a poor analogy for an additional reason: they govern only *new* sources, while Section 316(b) governs both new and existing sources. See 33 U.S.C. 1316(b)(1)(B). Congress generally imposes stricter requirements on new sources because it is generally more feasible and less expensive for technology to be installed in new sources when they are first being built than for existing facilities to be reconfigured to incorporate that technology. See, *e.g.*, *CPC Int'l, Inc.* v. *Train*, 540 F.2d 1329, 1341 (8th Cir. 1976), cert. denied, 430 U.S. 966 (1977); *American Iron & Steel Inst.* v. *EPA*, 526 F.2d 1027, 1058 (3d Cir. 1975), amended, 560 F.2d 589 (1977). The applicability of Section 316(b)'s BTA standard to both new and existing sources demonstrates not only that the BADT analogy is inapposite, but also that flexibility is needed in the application of the BTA standard. Section 316(b)'s broader coverage also provides another basis for Congress's decision to confer greater discretion on EPA to implement Section 316(b) than to implement the Section 301 and 306 standards.

C. The Court Of Appeals Usurped EPA's Discretion By Imposing Extra-Textual Constraints On EPA's Consideration Of Various Factors

Because Section 316(b) does not "directly [speak] to the precise question at issue," *Chevron*, 467 U.S. at 842, and Congress granted EPA broad rulemaking authority to administer the Act, see 33 U.S.C. 1361(a), EPA's reasonable interpretation of the ambiguous statutory text is entitled to deference, *Chevron*, 467 U.S. at 843.

EPA's authority includes "the formulation of policy and the making of rules to fill any gap left, implicitly or explicitly, by Congress." *Ibid.* (quoting *Morton* v. *Ruiz*, 415 U.S. 199, 231 (1974)).

EPA has long construed Section 316(b) to permit consideration of the relationship between costs and benefits. Cf. *Barnhart* v. *Walton*, 535 U.S. 212, 219-220 (2002). As early as 1977, EPA issued a permitting decision and a General Counsel opinion that explained that, while Section 316(b) does not require a formal cost-benefit analysis, it would *not* be "reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 and 2)*, No. 76-7, 1977 WL 22370 (E.P.A. June 10, 1977), remanded on other grounds, 572 F.2d 872 (1st Cir. 1978); accord *In re Cent. Hudson Gas & Elec. Corp., Op. EPA Gen. Counsel*, NPDES No. 63, 1977 WL 28250, at *8 (E.P.A. July 29, 1977). Thus, the legal framework followed for more than 30 years has provided for EPA and state permitting authorities to consider the relationship between costs and benefits to at least that extent in making individual permitting decisions. See, *e.g.*, *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 and 2)*, No. 76-7, 1978 WL 21140 (E.P.A. Aug. 4, 1978) (finding that an alternative's costs would be wholly disproportionate to its benefits), aff'd, *Seacoast Anti-Pollution League* v. *Costle*, 597 F.2d 306, 311 (1st Cir. 1979) (upholding the agency's consideration of costs); C.A. App. 492 (EPA determination, as part of 1988 permitting decision, that closed-cycle cooling towers were not BTA for a facility because the costs would be "wholly disproportionate to the environmental benefit"); *id.* at 351 (EPA determination, as part of 1986 per-

mitting decision, that an alternative was not BTA because its costs were "wholly disproportionate to anticipated benefits"); J.A. 140 (describing "measures that have been required" by EPA when other technologies would have "wholly disproportionate" costs).

While the court of appeals recited deference principles, Pet. App. 16a-17a, the court sharply departed from those principles. The degree of that departure is underscored not only by the implausibility of the court's contention that Section 316(b) unambiguously precludes consideration of the relationship between costs and benefits, but also by the extent to which the court attempted to micro-manage EPA's decisionmaking by establishing rules that cannot be found anywhere in the Act. The court concluded, for example, that EPA may consider costs as part of "cost-effectiveness" but not "cost-benefit" analysis—terms that appear nowhere in Section 316(b). See *id.* at 24a, 26a. After consulting the definition of "cost-effectiveness" found in an OMB circular that does not purport to interpret Section 316(b), the court proclaimed that EPA could adopt a significantly cheaper technology that would save 99-101 fish instead of 100-103 fish. *Id.* at 22a-23a & n.10, 27a. While it is not clear what result the court of appeals would reach if five or ten additional fish were potentially affected instead of one or two, the point for present purposes is that the court of appeals' approach contravenes the principles of *Chevron* by usurping the agency's role of construing and filling in gaps in an ambiguous statute. As this Court has made clear, "a court may not substitute its own construction of a statutory provision for a reasonable interpretation made by the administrator of an agency." *Chevron*, 467 U.S. at 844.

Indeed, by permitting the agency to weigh costs against at least one or two fish, the court of appeals essentially permitted EPA to consider the relationship between costs and benefits, but only in the most extreme cases. Even on its own terms, therefore, the court of appeals' decision lacks a principled grounding in the statutory text, because nothing in the Act unambiguously permits such consideration but limits it in the manner the court of appeals imposed.

Moreover, the court of appeals agreed to let EPA consider other practical factors, such as energy efficiency and countervailing environmental effects. Pet. App. 26a-27a n.12. While those factors are important, the lines drawn by the court of appeals are by no means required by the Act. The statutory standard makes no more reference to a technology's energy efficiency than to the relationship between costs and benefits. Indeed, energy efficiency could be viewed as a cost issue, because a power plant's less efficient operation due to the use of new technology increases the cost of producing the same amount of energy. Yet the court of appeals permitted EPA to weigh energy efficiency but not costs against benefits.

The court of appeals also was of the view that BTA must be "technology-driven," and that a standard selected based in part on cost-effectiveness analysis (or energy efficiency) is technology-driven, while a standard based in part on cost-benefit analysis is not. Pet. App. 24a. There is no statutory basis for those distinctions. Once one recognizes (as the court of appeals did) that EPA has discretion to consider factors other than technology, the Act provides no basis for the court of appeals' picking and choosing among such factors, especially among factors that EPA is expressly required to

consider under one or more of the cross-referenced standards in Sections 301 and 306. That is especially true with respect to cost-benefit analysis. Section 316(b) does not require the use of technology for technology's sake. Instead, it expressly looks to benefits by requiring the best technology available for *minimizing adverse environmental impact*. *Id.* at 157a, 249a-250a. And, as discussed above, the BTA standard and all of the cross-referenced provisions in Sections 301 and 306 authorize consideration of costs. See pp. 15-21, *supra*. As long as EPA is considering both costs and benefits, nothing in the Act prohibits the agency from considering the relationship between the two.

D. There Is No Basis For Applying An Artificial Presumption Against Consideration Of The Relationship Between Costs And Benefits

The court of appeals turned normal rules of statutory construction and *Chevron* deference on their head by reasoning that, if Congress had intended to permit cost-benefit analysis, it would have clearly said so. See Pet. App. 25a. There is no logical or precedential basis for such a presumption against cost-benefit analysis. But even if there were, it would not apply in the context of this case, where Congress intended to confer broad authority on the agency and expressly cross-referenced sections that require cost-benefit analysis.

a. Congress's *silence* on whether an agency may consider the relationship between costs and benefits provides no basis for inferring an unambiguous legislative prohibition against such consideration. "[S]ilence, after all, normally creates ambiguity. It does not resolve it." *Barnhart*, 535 U.S. at 218. And in *Chevron*, this Court admonished that, "if a statute is silent * * *

with respect to the specific issue, the question for the Court is whether the agency's answer is based on a permissible construction of the statute." 467 U.S. at 843.

On unusual occasions, this Court has erected a plain statement rule in order to avoid constitutional difficulties, *e.g.*, *Gregory* v. *Ashcroft*, 501 U.S. 452, 460-461, 464 (1991), or because of the unlikelihood that Congress would have intended a result, *e.g.*, *Spector* v. *Norwegian Cruise Line Ltd.*, 545 U.S. 119, 131-132 (2005). But there is nothing inherently suspect about weighing costs and benefits. Numerous environmental and other statutes require or permit such analysis. See, *e.g.*, Matthew D. Adler & Eric A. Posner, *Rethinking Cost-Benefit Analysis*, 109 Yale L.J. 165, 167 (1999). And in everyday life, people routinely determine whether an item is worth its cost. See pp. 13-14, *supra*. Thus, "other things being equal, [the Court] should read silences or ambiguities in the language of regulatory statutes as permitting, not forbidding, this type of rational regulation." *Whitman* v. *American Trucking Ass'ns, Inc.*, 531 U.S. 457, 490 (2001) (Breyer, J., concurring in part and in the judgment).

The court of appeals erred in reading *American Textile Manufacturers Institute* v. *Donovan*, 452 U.S. 490, 510 (1981), as erecting a presumption against consideration of the relationship between costs and benefits. See Pet. App. 24a-25a. *Donovan* upheld the Occupational Safety and Health Administration's determination that it was not *required* to undertake cost-benefit analysis under a different statute. *Donovan*, 452 U.S. at 506, 541. Moreover, *Donovan* predated *Chevron*. Thus, while *Donovan* stated that, "[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the stat-

ute," *id.* at 510-511, the *Donovan* Court did not have occasion to address the question whether silence unambiguously *precludes* consideration of costs and benefits. Indeed, the dissenting opinion in *Donovan* construed the Court's opinion as "suggest[ing] * * * that the Act *permits* the Secretary to undertake [a cost-benefit] analysis if he so chooses." *Id.* at 544 (Rehnquist, J., dissenting).

More recent court of appeals decisions applying *Chevron* principles of statutory construction have construed congressional silence as permitting cost-benefit analysis. See, *e.g.*, *Sierra Club* v. *United States EPA*, 314 F.3d 735, 744 (5th Cir. 2002); *Michigan* v. *United States EPA*, 213 F.3d 663, 678-679 (D.C. Cir. 2000) (citing cases), cert. denied, 532 U.S. 903, and 532 U.S. 904 (2001). The District of Columbia Circuit, for example, has explained that "[i]t is only where there is clear congressional intent to preclude consideration of cost that we find agencies barred from considering costs." *Michigan*, 213 F.3d at 678 (internal quotation marks and citation omitted). The court of appeals erred by relying on a contrary presumption.

Riverkeeper's reliance (Br. in Opp. 25-26) on *Whitman* is also misplaced. In that case, the Court agreed with EPA that the Clean Air Act (CAA), 42 U.S.C. 7401 *et seq.*, unambiguously precludes consideration of costs in setting National Ambient Air Quality Standards (NAAQS). 531 U.S. at 464-465. The Court stated that, because NAAQS are "the engine that drives" much of the CAA, EPA could consider costs only if Congress had provided a clear textual commitment of such authority to the agency. *Id.* at 467-468. The Court then agreed with EPA that the text of the CAA—which requires EPA to set NAAQS at levels "requisite to protect the

public health" with "an adequate margin of safety," 42 U.S.C. 7409(b)(1)—"unambiguously bars cost considerations from the NAAQS-setting process" when that provision is "interpreted in its statutory and historical context and with appreciation for its importance to the CAA as a whole." 531 U.S. at 471.

Whitman is inapposite for a number of reasons. While that case applied a presumption against *any consideration of costs* in setting NAAQS, the court of appeals here held that EPA *may* consider costs in determining BTA. See Pet. App. 26a. The question here is not (as it was in *Whitman*) whether EPA may consider costs at all in setting the relevant standards, but whether the agency's consideration of costs may take the form of cost-benefit analysis. A presumption against any consideration of costs provides little if any support for the court of appeals' decision permitting the agency to consider costs but greatly circumscribing its manner of doing so, which is presumably why the court of appeals itself did not rely on *Whitman*.

In addition, the *Whitman* Court repeatedly emphasized that its holding turned on the NAAQS' centrality to the CAA. See 531 U.S. at 468, 469 n.1, 471. Thus, the Court did not disapprove the District of Columbia Circuit's cases holding that EPA may generally consider costs in the absence of an express directive to the contrary. Instead, the *Whitman* Court emphasized that "[n]one of the sections of the CAA in which the District of Columbia Circuit has found authority for the EPA to consider costs shares [Section] 109(b)(1)'s prominence in the overall statutory scheme." *Id.* at 469 n.1 (citing, *e.g.*, *Michigan*, 213 F.3d at 678-679). As explained above, Section 316(b)'s single sentence concerning the *intake* of water is by no means the centerpiece of the CWA.

Rather, it is "something of an afterthought, having been added by the conference committee without substantive comment," *Riverkeeper I*, 358 F.3d at 186 n.12, that addresses a unique issue separate and apart from the CWA's normal focus on the *discharge* of pollutants into waters of the United States. See p. 23, *supra*. Thus, there is no basis for applying a presumption against weighing of costs and benefits in this case.

b. Even if some presumption applied here, it would be overcome by the statutory text, context, and legislative history discussed above. The text of Section 316(b)'s BTA standard, combined with its cross-reference to Sections 301 and 306, provides a strong textual basis for concluding that cost-benefit analysis is permissible. Moreover, the terseness of the relevant statutory text, coupled with the circumstances of its enactment, make clear that Congress intended to confer especially broad authority on EPA to address the unique problems associated with intake of water by cooling towers. See pp. 22-23, *supra*. Thus, as the Second Circuit observed in *Riverkeeper I*, "[t]o the extent [Section 316(b)] is silent on issues to which other sections speak, [a court should] hesitate to draw the negative inference that the brevity of section 316(b) reflects an intention to limit the EPA's authority rather than a desire to delegate significant rulemaking authority to the Agency." 358 F.3d at 186 n.12. That understates the matter because such "hesitat[ion]" is, of course, compelled by *Chevron*. See 467 U.S. at 842-843.

E. EPA's Consideration Of Costs And Benefits In The Rulemaking At Issue Here Fell Well Within Its Discretion

In the rulemaking here, EPA explained that "the relationship of costs to environmental benefits is an important" consideration, because "EPA has long recognized that there should be some reasonable relationship between the cost of cooling water intake structure control technology and the environmental benefits associated with its use." Pet. App. 253a. EPA also made clear, however, that the relationship between costs and benefits was not, by itself, determinative. Instead, selecting BTA "encompasses consideration of effectiveness, costs, non-water quality environmental impacts, feasibility issues and a host of other considerations." *Id.* at 219a.

EPA then considered costs along with other factors in selecting national BTA performance standards. See Pet. App. 255a-261a, 368a-369a. In addition, EPA authorized individual facilities to seek site-specific BTA determinations if, on a facility-specific basis, the costs of compliance with the national standard would be significantly greater than the benefits. 40 C.F.R. 125.94(a)(5)(ii). In each instance, EPA's consideration of costs and benefits was reasonable and fell comfortably within its statutory authority.

1. EPA based the national performance standards on its weighing of multiple relevant factors

a. EPA determined BTA after analyzing the various options' "overall efficacy, availability, economic practicability, including economic impact and the relationship of costs with benefits, and non-water quality environmental impacts, including energy impacts." Pet. App. 253a.

EPA ultimately selected a combination of technologies to reflect BTA for existing large power plants. *Id.* at 224a-229a. Based on those technologies, EPA then established national performance standards for reducing impingement mortality (by 80%-95%) and entrainment (by 60%-90%), but did not require the use of any specific technology to achieve those standards. See 40 C.F.R. 125.94(b); Pet. App. 226a-227a.

EPA rejected closed-cycle cooling technology as BTA "based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations." Pet App. 255a. EPA had selected closed-cycle cooling technology as BTA for *new* facilities in the Phase I rulemaking, but the agency determined that "retrofit[ting] existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable." *Ibid.* The agency explained that the cost of closed-cycle recirculating cooling towers for Phase II facilities was many times higher than for Phase I facilities—at least $130-$200 million per tower, and probably more than that, with additional annual operating costs of up to $20 million per facility, compared to annual costs as low as $170,000 for new facilities. *Id.* at 255a-256a.

In addition to considering costs, EPA stressed that mandatory closed-cycle cooling technology would impose an "energy penalty" because existing fossil-fuel power plants that installed that technology would produce between 2.4% and 4% less electricity while consuming the same amount of coal. Construction of 20 additional plants could be required to make up for the lost produc-

tion, thereby increasing both financial costs and air pollution. Pet. App. 257a-258a.

Finally, EPA compared the effectiveness of closed-cycle cooling technology with the option that it ultimately selected, and determined that, "[a]lthough not identical, the ranges of impingement and entrainment reduction are similar under both options." Pet. App. 260a. After "consider[ing] this similarity in efficacy," along with the other factors noted above, EPA determined that "the total capital cost investment and associated economic impact is simply too high * * * for EPA to be able to justify selecting cooling towers" as BTA. *Id.* at 261a; see *id.* at 260a, 368a-369a.

b. EPA's decisionmaking is fully consistent with its authority to consider costs and benefits under Section 316(b). As explained above, Section 316(b) permits EPA to consider the relationship between costs and benefits. Moreover, the agency's analysis ultimately turned on the fact that its chosen option produces similar results to closed-cycle cooling technology at much lower cost and with less harm to the Nation's energy supply and air quality. See Pet. App. 260a-261a, 368a-369a.

Thus, the agency's analysis may be permissible even under the cramped standard fashioned by the court of appeals. The court of appeals held that EPA may undertake what the court referred to as "cost-effectiveness" analysis by "choos[ing] [a] cheaper technology" even if that technology is somewhat less effective than a significantly more costly technology. Pet. App. 27a. The court also acknowledged that EPA may consider "energy efficiency or environmental impact." *Id.* at 26a n.12. As discussed above, EPA undertook that type of analysis. While it is not clear whether the court of appeals would conclude that EPA had considered cost-effectiveness

only within a sufficiently "narrowly bounded range," *id.* at 28a, or whether the court of appeals would ultimately agree with EPA's balancing of the various other relevant factors, those matters fall well within EPA's discretion, not the court of appeals'. Cf. *id.* at 32a-37a (remanding for EPA to provide a further explanation of the basis for its decision).[2]

Indeed, *Riverkeeper I* strongly suggested as much. In the Phase I Rule, EPA rejected a technology, known as dry cooling, that "dramatically reduc[ed] impingement and entrainment" by "virtually eliminat[ing] the need for cooling water." *Riverkeeper I*, 358 F.3d at 194. EPA determined that, among other things, "dry cooling costs more than ten times as much per year as closed-cycle wet cooling, but it is estimated to reduce water intake by only an additional 5 percent relative to once-through cooling." *Id.* at 194 (footnotes omitted). EPA also considered a variety of other factors, including energy consumption and air emissions. *Id.* at 195. Recognizing that EPA's weighing of relevant factors falls within the agency's "considerable discretion," the court noted that it was "not well equipped * * * to meaningfully weigh a 95 percent reduction in entrainment against .027 percent of new generating capacity, 300 pounds of mercury, and $443 million dollars." *Id.* at 196.

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[2] The court of appeals' definition of the term "cost-effective" sows confusion because it differs from EPA's use of that term. The court defined cost-effectiveness to refer to the least expensive method of achieving a narrowly bounded level of benefit. See Pet. App. 23a, 28a. In the rulemaking below, however, EPA's cost-effectiveness analysis compared the *incremental* cost of a technology to its *incremental* benefits. Thus, while EPA explained that its decision was based in part on cost-effectiveness considerations, the agency also made clear that its cost-effectiveness analysis looked to the relationship between costs and benefits. See, *e.g.*, *id.* at 260a-261a.

In reviewing EPA's determination of BAT and BADT limitations under Sections 301 and 306, other courts of appeals have likewise observed that, because "Congress did not mandate any particular structure or weight for the many [relevant] factors," *Weyerhaeuser Co.* v. *Costle*, 590 F.2d 1011, 1045 (D.C. Cir. 1978), EPA has "considerable discretion in evaluating the relevant factors and determining the weight to be accorded to each." *Texas Oil & Gas Ass'n* v. *United States EPA*, 161 F.3d 923, 928 (5th Cir. 1998); see *NWF* v. *EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002); *BP Exploration*, 66 F.3d at 796.[3]

2. EPA permissibly authorized site-specific determinations in circumstances where costs significantly exceed benefits

In addition to establishing nationwide performance standards, EPA authorized the operator of an individual facility to apply for a site-specific determination of BTA if the facility's costs of complying with the national performance standards "would be significantly greater than the benefits." 40 C.F.R. 125.94(a)(5)(ii). If the operator makes that showing with "reliable, scientifically valid" data, "[t]he [agency] must establish site-specific alternative requirements * * * that achieve an efficacy that, in the judgment of the [agency], is as close as practicable to the applicable performance standards * * * without resulting in costs that are significantly greater

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[3] The court of appeals upheld EPA's authority to express BTA as a range, but remanded EPA's chosen ranges based on its view that Section 316(b) requires "as much reduction of adverse environmental impacts as is technologically possible." Pet. App. 43a. Because that holding is based on the court's erroneous construction of the Act, it should be reversed as well.

than the benefits at [the] facility." *Ibid.*; see Pet. App. 222a-224a.[4]

That provision, which is consistent with the historic practice of determining BTA on a facility-specific, best-professional-judgment basis, recognizes that site-specific differences among facilities might warrant different results. The agency explained that its "comparison of national costs to national benefits may not be applicable to a specific site due to variations in (1) the performance of intake technologies and (2) characteristics of the waterbody in which the intake(s) are sited." Pet. App. 250a. "For example, there may be some facilities where the absolute numbers of fish and shellfish impinged and entrained is so minimal that the cost to achieve the required percentage reductions would be significantly greater than the benefits of achieving the required reductions at that particular site." *Ibid.*; see *id.* at 355a-356a.

The court of appeals invalidated that provision based on its view that cost-benefit analysis is impermissible. Pet. App. 56a-60a. As explained above, that was error. The court underscored its error by taking particular exception to EPA's determination that a cost-benefit variance might be appropriate if very few aquatic organisms were subject to impingement or entrainment in a particular waterbody, such that there would be little benefit in that waterbody from the use of more costly

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[4] EPA also authorized an application for a site-specific determination of BTA if a particular facility's compliance costs "would be significantly greater than the costs considered by the Administrator * * * in establishing the applicable performance standards." 40 C.F.R. 125.94(a)(5)(i). The court of appeals remanded that provision for procedural reasons that are distinct from the question presented here. Pet. App. 49a-56a.

technology. See *id.* at 58a-60a. The court determined that EPA may not consider water quality, and thus may not consider whether or to what extent a technology would have greater environmental benefits than a less expensive alternative. See *ibid.* As discussed above, however, Section 316(b) requires BTA for "minimizing adverse environmental impact," and thus makes the environmental benefit to be achieved an important consideration. See pp. 29-30, *supra*. Especially considering that EPA authorized a site-specific BTA only when the costs of complying with the nationwide performance standards would be "significantly greater" than the benefits, and that the agency nonetheless required a site-specific BTA to "achieve an efficacy that * * * is as close as practicable to the applicable performance standards" consistent with the significantly-greater test, 40 C.F.R. 125.94(a)(5)(ii), EPA did not exceed its broad discretion under Section 316(b).[5]

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[5] In the context of facility-specific BTA determinations, EPA's long-standing view has been that it would be unreasonable to select as BTA a technology whose costs are wholly disproportionate to its benefits. See pp. 27-28, *supra*. For purposes of the site-specific variance provision, EPA used a less stringent "significantly greater than" test in this rulemaking. 40 C.F.R. 125.94(a)(5)(ii). EPA's legal interpretations have been consistent because the agency has not taken the position that the "wholly disproportionate" standard is the *only* permissible way to consider the relationship between costs and benefits; instead, EPA has opined that it would be unreasonable to ignore a disproportionality of that degree. See p. 27, *supra*. In addition, permit writers considered the "wholly disproportionate" test in conjunction with other factors as part of an overall best-professional-judgment determination. Whether to permit a variance from the new nationwide performance standards presents a different question, and EPA has long stressed the need for flexibility in determining BTA for any particular facility. *E.g.*, Pet. App. 250a-251a; J.A. 42-45. The need for flexibility is particularly great for existing (Phase II) facilities, because owners of newer facilities have far

CONCLUSION

The judgment of the court of appeals should be reversed with respect to the performance standards and the site-specific cost-benefit provision and the case remanded.

Respectfully submitted.

GREGORY G. GARRE
Acting Solicitor General
RONALD J. TENPAS
Assistant Attorney General
EDWIN S. KNEEDLER
Deputy Solicitor General
DARYL JOSEFFER
Assistant to the Solicitor General
DAVID S. GUALTIERI
CYNTHIA J. MORRIS
JESSICA O'DONNELL
Attorneys

PATRICIA K. HIRSCH
Acting General Counsel
RICHARD T. WITT
Attorney
Environmental Protection Agency
Washington, D.C. 20460

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more flexibility in building new technology into the initial design. J.A. 309; 68 Fed. Reg. 13,541 (2003); 67 Fed. Reg. 17,145 (2002). In addition, EPA determined that the more flexible "significantly greater than" standard was needed in this context to avoid unwarranted energy impacts, because the Phase II rule affects approximately 55% of the Nation's electric-generating capacity. 68 Fed. Reg. at 13,541; 67 Fed. Reg. at 17,145-17,146; J.A. 309. In any event, the court of appeals' decision does not rest on the difference between the "wholly disproportionate" and "significantly greater than" standards; instead, the court erroneously insisted on its own, distinct "cost effectiveness" test. See Pet. App. 26a; cf. *id.* at 55a-56a n.25 (noting the court's "discomfort" with the "significantly greater than" test).

APPENDIX

1. 33 U.S.C. 1311 provides in pertinent part:

Effluent limitations

(a) Illegality of pollutant discharges except in compliance with law

Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

(b) Timetable for achievement of objectives

In order to carry out the objective of this chapter there shall be achieved—

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 1314(b) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 1317 of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 1325 of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment re-

quirements and any other requirement under section 1317 of this title;

(B) Repealed. Pub. L. 97-117, § 21(b), Dec. 29, 1981, 95 Stat. 1632.

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 1317 of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to section 1314(a)(4) of this title shall require application of the best conventional pollutant control

technology as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(4) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of section 1342(a)(1) of this title in a permit issued after February 4, 1987, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are established, and in no case later than March 31, 1989.

(c) Modification of timetable

The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any

point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

(d) Review and revision of effluent limitations

Any effluent limitation required by paragraph (2) of subsection (b) of this section shall be reviewed at least every five years and, if appropriate, revised pursuant to the procedure established under such paragraph.

(e) All point discharge source application of effluent limitations

Effluent limitations established pursuant to this section or section 1312 of this title shall be applied to all point sources of discharge of pollutants in accordance with the provisions of this chapter.

(f) Illegality of discharge of radiological, chemical, or biological warfare agents, high-level radioactive waste, or medical waste

Notwithstanding any other provisions of this chapter it shall be unlawful to discharge any radiological, chemical, or biological warfare agent, any high-level radioactive waste, or any medical waste, into the navigable waters.

(g) Modifications for certain nonconventional pollutants

(1) General authority

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F) of this section) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

(2) Requirements for granting modifications

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that—

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not

result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

(3) Limitation on authority to apply for subsection (c) modification

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

(4) Procedures for listing additional pollutants

(A) General authority

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for pollutants identified pursuant to section 1314(a)(4) of this title, toxic pollutants subject to section 1317(a) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

(B) Requirements for listing

(i) Sufficient information

The person petitioning for listing of an additional pollutant under this subsection shall submit to the Administrator sufficient information to make the determinations required by this subparagraph.

(ii) Toxic criteria determination

The Administrator shall determine whether or not the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title.

(iii) Listing as toxic pollutant

If the Administrator determines that the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title, the Administrator shall list the pollutant as a toxic pollutant under section 1317(a) of this title.

(iv) Nonconventional criteria determination

If the Administrator determines that the pollutant does not meet the criteria for listing as a toxic pollutant under such section and determines that adequate test methods and sufficient data are available to make the determinations required by paragraph (2) of this subsection with respect to the pollutant, the Administrator shall add the pollutant to the list of pollutants specified in paragraph (1) of this subsection for which modifications are authorized under this subsection.

(C) Requirements for filing of petitions

A petition for listing of a pollutant under this paragraph—

(i) must be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under Section 1314 of this title;

(ii) may be filed before promulgation of such guideline; and

(iii) may be filed with an application for a modification under paragraph (1) with respect to the discharge of such pollutant.

(D) Deadline for approval of petition

A decision to add a pollutant to the list of pollutants for which modifications under this subsection are authorized must be made within 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title.

(E) Burden of proof

The burden of proof for making the determinations under subparagraph (B) shall be on the petitioner.

(5) Removal of pollutants

The Administrator may remove any pollutant from the list of pollutants for which modifications are authorized under this subsection if the Administrator determines that adequate test methods and sufficient data are no longer available for determining whether

or not modifications may be granted with respect to such pollutant under paragraph (2) of this subsection.

* * * * *

2. 33 U.S.C. 1314 provides in pertinent part:

Information and guidelines

(a) Criteria development and publication

* * * * *

(4) The Administrator shall, within 90 days after December 27, 1977, and from time to time thereafter, publish and revise as appropriate information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH. The thermal component of any discharge shall not be identified as a conventional pollutant under this paragraph.

* * * * *

(b) Effluent limitation guidelines

For the purpose of adopting or revising effluent limitations under this chapter the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of October 18, 1972, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. Such regulations shall—

(1)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best practicable control technology currently available

for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the control measures and practices to be applicable to point sources (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best practicable control technology currently available to comply with subsection (b)(1) of section 1311 of this title shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(2)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best measures and practices available to comply with subsection (b)(2) of section 1311 of this title to be applicable to any point source

(other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(3) identify control measures and practices available to eliminate the discharge of pollutants from categories and classes of point sources, taking into account the cost of achieving such elimination of the discharge of pollutants; and

(4)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best conventional pollutant control technology (including measures and practices) for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best conventional pollutant control technology measures and practices to comply with section 1311(b)(2)(E) of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best conventional pollutant control technology (including measures

and practices) shall include consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, and shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.

3. 33 U.S.C. 1316 provides:

National standards of performance

(a) Definitions

For purposes of this section:

(1) The term "standard of performance" means a standard for the control of the discharge of pollutants which reflect the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

(2) The term "new source" means any source, the construction of which is commenced after the publication of proposed regulations prescribing a standard of performance under this section which will be applicable to such

source, if such standard is thereafter promulgated in accordance with this section.

* * * * *

(b) Categories of sources; Federal standards of performance for new sources

(1)(A) The Administrator shall, within ninety days after October 18, 1972, publish (and from time to time thereafter shall revise) a list of categories of sources, which shall, at the minimum, include:

pulp and paper mills;

paperboard, builders paper and board mills;

meat product and rendering processing;

dairy product processing;

grain mills;

canned and preserved fruits and vegetables processing;

canned and preserved seafood processing;

sugar processing;

textile mills;

cement manufacturing;

feedlots;

electroplating;

organic chemicals manufacturing;

inorganic chemicals manufacturing;

plastic and synthetic materials manufacturing;

soap and detergent manufacturing;

fertilizer manufacturing;

petroleum refining;

iron and steel manufacturing;

nonferrous metals manufacturing;

phosphate manufacturing;

steam electric powerplants;

ferroalloy manufacturing;

leather tanning and finishing;

glass and asbestos manufacturing;

rubber processing; and

timber products processing.

(B) As soon as practicable, but in no case more than one year, after a category of sources is included in a list under subparagraph (A) of this paragraph, the Administrator shall propose and publish regulations establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one hundred and twenty days after publication of such proposed regulations, such standards with such adjustments as he deems appropriate. The Administrator shall, from time to time, as technology and alternatives change, revise such standards following the procedure required by this subsection for promulgation of such standards. Standards of performance, or revisions thereof, shall become effective upon promulgation. In establishing or revising Federal standards of performance for new sources under this section, the Administrator shall take into con-

sideration the cost of achieving such effluent reduction, and any non-water quality, environmental impact and energy requirements.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards and shall consider the type of process employed (including whether batch or continuous).

(3) The provisions of this section shall apply to any new source owned or operated by the United States.

* * * * *

4. 33 U.S.C. 1326 provides:

Thermal discharges

(a) Effluent limitations that will assure protection and propagation of balanced, indigenous population of shellfish, fish, and wildlife

With respect to any point source otherwise subject to the provisions of section 1311 of this title or section 1316 of this title, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such sections for such plant, with respect to the thermal component of such discharge

(taking into account the interaction of such thermal component with other pollutants), that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.

(b) Cooling water intake structures

Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

(c) Period of protection from more stringent effluent limitations following discharge point source modification commenced after October 18, 1972

Notwithstanding any other provision of this chapter, any point source of a discharge having a thermal component, the modification of which point source is commenced after October 18, 1972, and which, as modified, meets effluent limitations established under section 1311 of this title or, if more stringent, effluent limitations established under section 1313 of this title and which effluent limitations will assure protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in or on the water into which the discharge is made, shall not be subject to any more stringent effluent limitation with respect to the thermal component of its discharge during a ten year period beginning on the date of completion of such modification or during the period of depreciation or amortization of such facility for the purpose of section 167 or 169 (or both) of title 26, whichever period ends first.

5. 33 U.S.C. 1362 provides in pertinent part:

Definitions

Except as otherwise specifically provided, when used in this chapter:

* * * * *

(13) The term "toxic pollutant" means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

6. 40 C.F.R. 125.83 provides in pertinent part:

What special definitions apply to this subpart?

* * * * *

Minimize means to reduce to the smallest amount, extent, or degree reasonably possible.

* * * * *

7. 40 C.F.R. 125.94 provides in pertinent part:

How will requirements reflecting best technology available for minimizing adverse environmental impact be established for my Phase II existing facility?

(a) *Compliance alternatives.* You must select and implement one of the following five alternatives for establishing best technology available for minimizing adverse environmental impact at your facility:

(1)(i) You may demonstrate to the Director that you have reduced, or will reduce, your flow commensurate with a closed-cycle recirculating system. In this case, you are deemed to have met the applicable performance standards and will *not* be required to demonstrate further that your facility meets the impingement mortality and entrainment performance standards specified in paragraph (b) of this section. In addition, you are not subject to the requirements in §§ 125.95, 125.96, 125.97, or 125.98. However, you may still be subject to any more stringent requirements established under paragraph (e) of this section; or

(ii) You may demonstrate to the Director that you have reduced, or will reduce, your maximum through-screen design intake velocity to 0.5 ft/s or less. In this case, you are deemed to have met the impingement mortality performance standards and will not be required to demonstrate further that your facility meets the performance standards for impingement mortality specified in paragraph (b) of this section and you are not subject to the requirements in §§ 125.95, 125.96, 125.97, or 125.98 as they apply to impingement mortality. However, you are still subject to any applicable requirements for entrainment reduction and may still be subject to any

more stringent requirements established under paragraph (e) of this section.

(2) You may demonstrate to the Director that your existing design and construction technologies, operational measures, and/or restoration measures meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section.

(3) You may demonstrate to the Director that you have selected, and will install and properly operate and maintain, design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the performance standards specified in paragraph (b) of this section and/or the restoration requirements in paragraph (c) of this section;

(4) You may demonstrate to the Director that you have installed, or will install, and properly operate and maintain an approved design and construction technology in accordance with § 125.99(a) or (b); or

(5) You may demonstrate to the Director that you have selected, installed, and are properly operating and maintaining, or will install and properly operate and maintain design and construction technologies, operational measures, and/or restoration measures that the Director has determined to be the best technology available to minimize adverse environmental impact for your facility in accordance with paragraphs (a)(5)(i) or (ii) of this section.

(i) If the Director determines that data specific to your facility demonstrate that the costs of compliance

under alternatives in paragraphs (a)(2) through (4) of this section would be significantly greater than the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards in paragraph (b) of this section, the Director must make a site-specific determination of the best technology available for minimizing adverse environmental impact. This determination must be based on reliable, scientifically valid cost and performance data submitted by you and any other information that the Director deems appropriate. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that is, in the judgment of the Director, as close as practicable to the applicable performance standards in paragraph (b) of this section, without resulting in costs that are significantly greater than the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards. The Director's site-specific determination may conclude that design and construction technologies, operational measures, and/or restoration measures in addition to those already in place are not justified because of the significantly greater costs. To calculate the costs considered by the Administrator for a facility like yours in establishing the applicable performance standards you must:

(A) Determine which technology the Administrator modeled as the most appropriate compliance technology for your facility;

(B) Using the Administrator's costing equations, calculate the annualized capital and net operation and

maintenance (O & M) costs for a facility with your design intake flow using this technology;

(C) Determine the annualized net revenue loss associated with net construction downtime that the Administrator modeled for your facility to install this technology;

(D) Determine the annualized pilot study costs that the Administrator modeled for your facility to test and optimize this technology;

(E) Sum the cost items in paragraphs (a)(5)(i)(B), (C), and (D) of this section; and

(F) Determine if the performance standards that form the basis of these estimates (*i.e.*, impingement mortality reduction only or impingement mortality and entrainment reduction) are applicable to your facility, and if necessary, adjust the estimates to correspond to the applicable performance standards.

(ii) If the Director determines that data specific to your facility demonstrate that the costs of compliance under alternatives in paragraphs (a)(2) through (4) of this section would be significantly greater than the benefits of complying with the applicable performance standards at your facility, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact. This determination must be based on reliable, scientifically valid cost and performance data submitted by you and any other information the Director deems appropriate. The Director must establish site-specific alternative requirements based on new and/or existing design and construction technologies, operational measures, and/or restoration measures that achieve an efficacy that, in the

judgment of the Director, is as close as practicable to the applicable performance standards in paragraph (b) of this section without resulting in costs that are significantly greater than the benefits at your facility. The Director's site-specific determination may conclude that design and construction technologies, operational measures, and/or restoration measures in addition to those already in place are not justified because the costs would be significantly greater than the benefits at your facility.

(b) *National performance standards.*—

(1) *Impingement mortality performance standards.* If you choose compliance alternatives in paragraphs (a)(2), (a)(3), or (a)(4) of this section, you must reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline.

(2) *Entrainment performance standards.* If you choose compliance alternatives in paragraphs (a)(1)(ii), (a)(2), (a)(3), or (a)(4) of this section, you must also reduce entrainment of all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline if:

(i) Your facility has a capacity utilization rate of 15 percent or greater, and

(ii)(A) Your facility uses cooling water withdrawn from a tidal river, estuary, ocean, or one of the Great Lakes; or

(B) Your facility uses cooling water withdrawn from a freshwater river or stream and the design intake flow of your cooling water intake structures is greater than five percent of the mean annual flow.

(3) *Additional performance standards for facilities withdrawing from a lake (other than one of the Great Lakes) or a reservoir.* If your facility withdraws cooling water from a lake (other than one of the Great Lakes) or a reservoir and you propose to increase the design intake flow of cooling water intake structures it uses, your increased design intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water, except in cases where the disruption does not adversely affect the management of fisheries. In determining whether any such disruption does not adversely affect the management of fisheries, you must consult with Federal, State, or Tribal fish and wildlife management agencies).

(4) *Use of performance standards for site-specific determinations of best technology available.* The performance standards in paragraphs (b)(1) through (3) of this section must also be used for determining eligibility for site-specific determinations of best technology available for minimizing adverse environmental impact and establishing site specific requirements that achieve an efficacy as close as practicable to the applicable performance standards without resulting in costs that are significantly greater than those considered by the Administrator for a facility like yours in establishing the performance standards or costs that are significantly greater than the benefits at your facility, pursuant to § 125.94(a)(5).

* * * * *

REPLY BRIEF

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In the Supreme Court of the United States

ENTERGY CORP.,
PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
AND
UTILITY WATER ACT GROUP,
PETITIONERS,
V.
RIVERKEEPER INC, ET AL.,
RESPONDENTS.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

REPLY BRIEF FOR PETITIONERS ENTERGY CORP., PSEG FOSSIL LLC, AND PSEG NUCLEAR LLC

ELISE E. ZOLI
Counsel of Record
KEVIN P. MARTIN
ROBERT H. FITZGERALD
ALADDINE D. JORDFF
KEVIN P. PECHULIS
GOODWIN PROCTER LLP
53 STATE STREET
BOSTON, MA 02109
(617) 570-1000
Counsel for Entergy Corp.

MAUREEN E. MAHONEY
Counsel of Record
PHILIP J. PERRY
J. SCOTT BALLENGER
CASSANDRA STURKIE
DREW C. ENSIGN
LATHAM & WATKINS LLP
555 11TH STREET, NW,
SUITE 1000
WASHINGTON, DC 20004
(202) 637-2200
Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

Additional Counsel Listed on Inside Cover

72807A 41

ABIGAIL HEMANI
GOODWIN PROCTER LLP
NEW YORK TIMES
BUILDING
620 8TH AVENUE
NEW YORK, NY 10018
(212) 813-8800

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. PEARL STREET
JACKSON, MS 39201
(601) 969-2542
Counsel for Entergy Corp.

KARL S. LYTZ
LATHAM & WATKINS LLP
505 MONTGOMERY STREET
SUITE 2000
SAN FRANCISCO, CA
94111
(415) 391-0600

JOHN G. VALERI, JR.
PSEG SERVICES CORP.
OFFICE OF
ENVIRONMENTAL
COUNSEL
80 PARK PLAZA, T5C
NEWARK, NJ 07102-4194
(973) 430-6298
Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

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ARGUMENT

Respondents suggest that Congress intended to mandate "the limits of [what] technology can achieve" to reduce impingement and entrainment "to the lowest level possible," completely without regard to costs or other competing priorities. Respondent States Br. ("States Br.") 18, 24. The plain language of §316(b) does not require that interpretation and it is wholly implausible. The Clean Water Act ("CWA" or "Act") *requires* EPA to compare costs with benefits in numerous effluent provisions directly affecting not just fish but human health, and where the Act's stated goal is the *complete elimination* of all pollutant discharges. By contrast, §316(b) requires only the "best technology available" ("BTA") "for minimizing adverse environmental impact," 33 U.S.C. §1326(b), and every other provision of the Act expressly governing fish describes the goal it sets as the maintenance of a "balanced population."

Respondents and their *amici* criticize a mode of decisionmaking they call "formal cost-benefit analysis," which, they argue, would require EPA to reject a more environmentally protective technology if the costs exceeded quantifiable monetary benefits by even a dollar. This is a red herring. EPA considered both quantifiable and qualitative costs and benefits and, in recognition of the scientific uncertainties respondents point to, left a substantial thumb on the scale for environmental protection. *See* UWAG Reply Br. 6-7, 30-35. For example, EPA's final rule adopted performance standards whose estimated annual costs exceeded quantified benefits by nearly five-to-one ($389.2 million to $82.9 million). Pet.App.526a (69 Fed.

Reg. at 41,666).[1] EPA also authorized site-specific variances only if costs are "significantly greater than" benefits. Pet.App.249a-51a (69 Fed. Reg. at 41,603-04; Pet.App.559a (40 C.F.R. §125.94(a)(5)(ii)). The issue in this case is whether EPA can compare costs and benefits *at all*. Riverkeeper effectively concedes that it can, by recognizing that the word "minimize" is flexible enough to permit EPA to decide that additional reductions in impingement and entrainment are "so minor as to be unnecessary." Riverkeeper Br. 29. And once the door to cost-benefit comparisons is opened, there is no persuasive basis for distinguishing between respondents' preferred *de minimis* test, EPA's traditional "wholly disproportionate" test, and the "significantly greater than" test established in the Phase II Rule for site-specific determinations of BTA. On the details, EPA is entitled to deference.

Respondents' position rejects key elements of the Second Circuit decision they ask this Court to affirm; it is internally inconsistent; and it contravenes the statutory, legislative, and linguistic evidence. It ignores the quarter century of precedent concerning deference to agencies since *Chevron*, repeatedly assuming that Congress's failure to command cost-benefit analysis is equivalent to a congressional prohibition. And it ultimately rests on the exceedingly unlikely notion that Congress chose to protect only a "balanced population" of fish from pollution or a cooling system's discharges of heated water, but intended to protect as many fish as financially possible from the *very same* cooling system's intakes of water, regardless

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[1] "Pet.App." refers to the Appendix to the Petition for Certiorari filed by Entergy Corp. in No. 07-588.

of the relationship of benefits to costs, even to the point of replacing the entire cooling system.

Respondents strain to manufacture a dispute between the United States and Petitioners, but the distinction between step one and step two of *Chevron* is paper thin in this case. Petitioners believe the statute delegates broad discretion to EPA. The United States suggests that the statutory language does not constrain the discretion EPA naturally possesses. Either way, the decision below must be reversed or, at a minimum, vacated.

I. THE WORDING OF §316(b) IS CONSISTENT WITH COST-BENEFIT ANALYSIS

A. Respondents Misconstrue §316(b)'s Language

Respondents break with their prior argument by forthrightly disavowing the Second Circuit's plain statement rule that "'[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has *clearly indicated such intent on the face of the statute*.'" Pet.App.25a (citation omitted) (emphasis added); *compare, e.g.*, Riverkeeper Br. 41-42 *with* Riverkeeper Cert. Opp. 26 (arguing that the Second Circuit correctly placed great "weight" on "Congress's conspicuous failure to authorize cost-benefit analysis"). Respondents' reluctance to carry the Second Circuit's water on this point is understandable, but without its interpretive presumption they must find an unambiguous intent to foreclose cost-benefit analysis in the language and structure of the CWA itself.

Petitioners, the United States, and their *amici* demonstrated that, as a matter of both dictionary definitions and common usage, the best technology

available for minimizing adverse environmental impact" is not necessarily the technology that impinges or entrains the fewest fish without bankrupting the industry. That phrase is naturally susceptible to a reading that leaves room for EPA to acknowledge competing values, including the relationship between costs and environmental benefits.

Respondents do not deny that petitioners' interpretation of the key terms finds support in dictionary definitions. They instead claim that their preferred definitions are listed earlier in the dictionary. *See* Riverkeeper Br. 23-27; States Br. 26-31. But every dictionary definition is sometimes the "best," or at least a correct, meaning in context. Respondents tellingly never cite any authority for their novel and mechanical approach to statutory interpretation. Furthermore, "it is axiomatic that [the agency's] interpretation ... need not be the best one by grammatical or any other standards." *EEOC v. Commercial Office Prods. Co.*, 486 U.S. 107, 115 (1988); *see also Knight v. Comm'r*, 128 S. Ct. 782, 789 (2008) (adopting definition of "would" listed eighth and last in *American Heritage Dictionary* 1984 (4th ed. 2000) ("*American Heritage*")); *Tellabs, Inc. v. Makor Issues & Rights, Ltd.*, 127 S. Ct. 2499, 2510 (2007) (adopting definition "11a" for "strong"). And "[t]he existence of alternative dictionary definitions ... each making some sense under the statute, itself indicates that the statute is open to interpretation." *Nat'l R.R. Passenger Corp. v. Boston & Me. Corp.*, 503 U.S. 407, 418 (1992).

- ***"Best"***

Respondents argue that the first definition of "best" in the American Heritage Dictionary is "surpassing all others in excellence." Riverkeeper Br.

24 (citing *American Heritage* 173). But the common, more flexible meaning invoked by petitioners—"[m]ost satisfactory, suitable, or useful"—is listed *second*. *American Heritage* 173. And respondents have no answer to the Black's Law Dictionary explanation that "'the "best bid" of interest by a prospective depository of school funds would not necessarily be the highest bid,'" but, after considering other relevant factors, "'might be the lowest bid.'" Entergy Br. 33-34 (quoting *Black's Law Dictionary* 160 (6th ed. 1990)).

Respondents also have no answer to the fact that Congress obviously used "best" in its broader, more flexible sense throughout the CWA. Congress *mandated* cost-benefit analysis under both the "best practicable control technology currently available" ("BPT") and "best conventional pollutant control technology" ("BCT") standards. Both begin with "best" and contain no other words that limit or qualify its meaning. "Practicable," for example, is the functional equivalent of "available" in §316(b), not a modification of the meaning of "best."[2] "Best" is the *only* operative adjective in the BCT standard, where Congress *mandated* cost-benefit analysis.[3] Of course petitioners contend that every "best technology"

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[2] "Practicable" does not have *any* definitions that would authorize cost-benefit comparisons in the face of an interpretation of "best" that would preclude them. "Practicable" means "*[c]apable* of being effected, done, or put into practice; feasible." *American Heritage* 1377 (emphasis added). And the "best available demonstrated control technology" ("BADT") standard, which respondents say *forbids* cost-benefit analysis, also uses that term.

[3] "Conventional" modifies "pollutant" and "conventional pollutants" are set out in 33 U.S.C. §1314(a)(4).

standard under the CWA at least permits EPA to engage in cost-benefit balancing. *See* Entergy Br. 38-42. Respondents disagree as to the "best available technology economically achievable" ("BAT") and BADT standards, but cannot deny that Congress expressly authorized EPA to consider *some* criteria other than maximum pollution control. The Act *always* allows EPA to designate a technology as "best" even if it is not the technology "surpassing all others" in achieving the Act's declared goal of eliminating all pollutant discharges.

While respondents suggest it would be absurd to read "best" to give EPA discretion to select a technology "based on whatever factors it deems proper," Riverkeeper Br. 23-24, Congress three times expressly gave EPA authority to consider "such other factors as [EPA] deems appropriate" for "best ... technology" standards, including BAT. *See* 33 U.S.C. §1314(b)(1)(B), (b)(2)(B), (b)(4)(B). Respondents also largely ignore the case law establishing that Congress intended "best" to mean "acceptable on the basis of numerous factors, only one of which is pollution control." *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 796 (6th Cir. 1995)).[4] And respondents completely ignore the D.C. Circuit's landmark decision in *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011 (D.C. Cir. 1978). As previously explained, the D.C. Circuit recognized that Congress gave EPA broad discretion to consider multiple criteria, including costs and

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[4] Riverkeeper ignores *BP Exploration*, while the States distinguish its clear holding as irrelevant *dicta*. States Br. 28 n.17. In fact, the Sixth Circuit's cost-benefit holding was essential to affirming EPA's standard. 66 F.3d at 796-97.

benefits, and that the salient difference between BPT and BAT is that Congress *mandated* cost-benefit analysis for BPT as a "comparison factor" whereas BAT gives EPA broad discretion to consider all criteria however it wishes, as permissive "consideration factors." *Id.* at 1045 (for BAT "[a]ll factors, including costs and benefits, are consideration factors."). Thus, the CWA "on its face lets EPA relate the various factors as it deems necessary," rather than imposing *any* congressionally-mandated limitations. *Id.* at 1046.[5]

Respondents likewise fail to confront the Second Circuit's decision in *Riverkeeper I*, which interpreted "best" and "minimize" *in §316(b)*. That court concluded that §316(b), like §§301 and 304, gave EPA "'considerable discretion to weigh and balance the various factors,'" including costs and benefits. *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 195-96 & n.22 (2d Cir. 2004) (citation omitted). Indeed, the court upheld EPA's rejection of a dry cooling requirement on the basis of cost-benefit analysis, even though dry

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[5] On respondents' side, only *amicus* Environment America addresses this analysis in *Weyerhaeuser*—and they implausibly disregard its extensive discussion, *see* 590 F.2d at 1045-46, as "loose language" and "*dicta*." *See* Envt. America Br. 27 n.22. Although Environment America suggests *Weyerhaeuser* held that "Congress rejected the optimal pollution theory," *id.* at 12, the D.C. Circuit merely observed that it "*appears that* Congress *doubted* these premises." 590 F.2d at 1041 n.41 (emphasis added). It did so only in rejecting the extraordinary argument that ocean dumping could be *categorically excluded* from effluent limitations. *Id.* at 1041-44. In addition, because both costs and benefits are "consideration factors," Environment America's reliance on *ejusdum generis* and *Hughey v. United States*, 495 U.S. 411 (1990), is misplaced. *See* Envt. America Br. 18-19.

cooling "is certainly ... an available technology, ... [and] 95 percent more effective than closed-cycle cooling." *Id.* And while even respondents are apparently unwilling to argue that dry cooling retrofits should be required, they provide no reason why their interpretation would not mandate it.

- ***"Minimize"***

Respondents apparently have no response to the American Heritage Dictionary's usage note on "minimize," which explains that the phrase "minimize the risk of accidents" should *"naturally"* and *"quite often"* indicate that "considerations of efficiency and cost are taken into account." *American Heritage* 1119 (emphasis added). That broader meaning of "minimize" is definition 1b—hardly "rarified and unlikely use[] of language." *See id.*; Riverkeeper Br. 24-26. *Compare* Riverkeeper Br. 25 (quoting definition 1a and arguing "ordinary definition" of minimize is "not simply 'to reduce'") *with American Heritage* 1119 (providing, as definition 1b, "to reduce").

Respondent States suggest (at 30) that a pedestrian seeking to "minimize" the risk of being struck by a car would "use every precautionary measure available to her." But a reasonable pedestrian would not build a multi-million dollar footbridge, rent an armored car, or even wait to cross in the dead of night to avoid traffic. In common parlance a pledge to "minimize" risk almost always implies some balance of safety and other important criteria, such as cost, convenience, and leisure.[6]

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[6] Respondents also rely heavily on EPA's definition of "minimize" in its 1976 rule, but that rule was vacated. Riverkeeper Br. 25, 43-44; States Br. 19-20, 29. Soon thereafter,

Once again, Congress used the more flexible sense of "minimize" *within the CWA itself*, by requiring the "drastic minimization" of paperwork. Respondents' definition would require the total elimination of paperwork and would render the word "drastic" nonsensical. *See* Entergy Br. 35. Respondents' maximalist interpretation of "minimize" also conspicuously ignores Congress's deliberate choice to use "minimize" in §316(b) instead of "eliminate," which is the explicit goal of §301 standards. *Id.* at 36-37.

- ***"For"***

Respondents also fail to engage genuinely with Congress's use of the phrasing "best for" instead of "best at" within §316(b), and would treat them as synonymous. But the best strategy *for* minimizing investment risk is not necessarily the best strategy *at* minimizing investment risk (*i.e.*, the strategy that reduces risk the most). Respondent States wrongly argue (at 27-28) that such examples "fail[] to acknowledge that the specifications of the particular job are relevant." Of course the specified task is relevant, but the preposition "for" makes more room for balancing objectives other than single-minded maximization of that task—the best person "at" a job is not the best person "for" a job if exorbitant salary demands outweigh any increase in efficiency.

Respondent States suggest (at 26-27) that the "best" method "for arriving home as quickly as

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EPA began interpreting §316(b) to permit cost-benefit analysis, and continued doing so for three decades. EPA's current (and long-held) interpretation is entitled to deference. *See* Entergy Br. 57-58 & n.25; *see also* UWAG Reply Br. 31-32 (discussing other flaws in respondents' reliance on 1976 rule).

possible" is necessarily the absolute quickest route. But §316(b) contains nothing like that "as possible" modifier. And any ordinary person committing to follow the "best" route for "minimizing" travel time would balance speed against costs, such as expensive tolls, the inconvenience of carpooling for HOV lane access, or the risks associated with driving through a dangerous area.

- ***"Adverse Environmental Impact"***

In any event §316(b) requires the best technology "for *minimizing adverse environmental impact*," not for eliminating impingement and entrainment. Nothing in the statute suggests that Congress thought the loss of every fish or plankton was itself an "adverse environmental impact." And saving every fish is *not* the goal of the CWA, as the *amicus* participation of the Commercial Fishermen of America *et al.* amply demonstrates. Although the CWA boldly declares a national goal of the complete "elimination" of pollutant discharges into navigable waters, its goals for aquatic life are repeatedly described in very different terms. Congress sought to protect a "balanced population"—not every fish. *See* 33 U.S.C. §§1311(g)(2)(C), 1311(h)(2), 1314(a)(5)(A), 1314(a)(5)(B), 1314(*l*)(1)(A), 1326(a). And the variance mandated in §316(a) for thermal discharges that do not threaten a "balanced, indigenous population of ... fish" indicates that Congress was *not* concerned about the consequences of once-through cooling systems on individual fish. 33 U.S.C. §1326(a). EPA could have concluded that the "adverse environmental impact" of a cooling system *intake* is effectively "minimized" if it protects that balanced population of fish. EPA should not lose the broad discretion Congress obviously intended just

because the agency chose to frame this Rule in terms of reducing impingement and entrainment losses. *See Chem. Mfrs. Ass'n v. NRDC*, 470 U.S. 116, 120, 133 (1985) ("*Chem. Mfrs. I*") (recognizing EPA's discretion to "temper[] with ... flexibility" its "necessarily rough-hewn" framework).

B. Respondents' Exceptions Are Internally Inconsistent And Do Not Remedy The Unreasonable Consequences Of Their Position

Respondents' textual argument is also at war with itself, because they feel compelled to introduce significant flexibility into their absolutist reading of §316(b) in order to mitigate its most extreme consequences. That endeavor is inconsistent with respondents' basic theory and is ultimately unsuccessful in resolving the absurd consequences of their interpretation.

Respondents adopt two starkly different methods of interpretation within the 46 short words of §316(b). While giving "best," "for," and "minimize" the strictest possible meanings, respondents adopt a strikingly flexible definition of "available."[7] Departing from their "earlier-listed" approach to dictionary definitions, respondents acknowledge that "available" in §316(b)

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[7] Respondents also must adopt a flexible meaning of "location, design, construction and capacity of cooling water intake structures" to support their argument below that closed-cycle cooling can be required in a §316(b) permit. Cooling towers are a wholly *separate* structure from the intake structure, and thus fall within the ambit of §316(b) only by interpreting those terms very loosely. *See* J.A.59-60 (decision of EPA General Counsel stating same).

cannot possibly have its primary dictionary meaning—*i.e.*, "[p]resent and ready for use; at hand; accessible." *American Heritage* 123. Instead, respondents concede that "available" has "potential ambiguity ... extend[ing] beyond physically available to include economically available [and] ... economic feasibility." Riverkeeper Br. 26-27. Respondents would, in effect, insert the word "reasonably" in front of "available." The common usage of "available" is certainly flexible enough to embrace that meaning. But applying even a fraction of that flexibility to any of "best," "for," or "minimize" would compel a conclusion that §316(b) is at least ambiguous. And why would Congress have given EPA substantial leeway to decide how much technology the industry can reasonably afford (*i.e.*, what technology is "available") (*see* Pet.App.26a), and essentially *no* leeway to consider the benefits side of the equation?

Respondents also argue that EPA may choose a less expensive technology if the benefits foregone would be *de minimis*. As Riverkeeper acknowledges (at 29), that authority must necessarily come from some additional flexibility or ambiguity in the word "minimize." Riverkeeper argues that "[a]lthough the meaning of 'minimizing' is plainly not merely to reduce, *it is just as plainly not so constricted as to require EPA to require industry petitioners to spend billions to save one more fish or plankton*," and that "the Agency has some discretion (albeit not boundless) to determine that further differences in reduction would be so minor as to be unnecessary." *Id.* (emphasis added).

Riverkeeper's "*de minimis*" exception is inconsistent with the Second Circuit's "cost

effectiveness" test, which would not permit EPA to select a technology saving "99-101 fish" if industry could bear the cost of technology saving "at least 102 fish." Pet.App.26a-28a. It also plainly envisions cost-benefit comparisons. If this *de minimis* exception is *not* a form of limited cost-benefit analysis, but instead merely a principle that additional benefits can be disregarded whenever they are small *without reference to cost*, then it makes no sense. Why forego small additional gains that could be secured at even smaller additional cost? Riverkeeper's allowance that EPA could conclude a "reduction would be so minor as to be unnecessary" also necessarily concedes that EPA can assign a value to further reductions in impingement and entrainment. Otherwise there would be no way to evaluate whether small improvements are "unnecessary" or *de minimis*. Indeed, it is impossible to see how a "so minor" test can be applied *without* weighing costs and benefits.

Respondents' *de minimis* exception is therefore also inconsistent with their own rigid assertions that "[t]he statute leaves *no room* for EPA to conclude that [achievable] benefits are not worth the costs." Riverkeeper Br. 27 (emphasis added). The statute is obviously flexible enough to permit some cost-benefit comparisons, and the appropriate threshold is a matter for EPA's expert discretion.[8] *Cf. Chem. Mfrs. Ass'n v.*

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[8] Respondents struggle to argue that EPA's long-standing "wholly disproportionate" standard is substantively no different than their *de minimis* exception. As demonstrated in UWAG's opening brief, that contention is inconsistent with three decades of permitting history. *See* UWAG Br. 15-16, 40-41. And in *Seacoast Anti-Pollution League v. Costle*, the First Circuit upheld EPA's decision that the costs of moving the intake even further offshore would be "'wholly disproportionate to any environmental benefit.'"

EPA, 870 F.2d 177, 225 (5th Cir. 1989) ("*Chem. Mfrs. II*") (recognizing "that complex scientific and technical issues" involved in weighing costs and benefits under CWA §301(n) "should be resolved in the first instance by the EPA, the entity best suited to pass on these issues"), *cert. denied*, 495 U.S. 910 (1990).

Furthermore, respondents' *de minimis* exception does not solve the absurd consequences of their interpretation. Even non-trivial levels of impingement and entrainment may have no ecological consequences that are remotely worth massive technology costs—if, for example, the species affected are extremely prolific or are invasive nuisance species targeted by state regulators. *See* UWAG Br. 7-11; UWAG Reply Br. 11 n.6.

Respondents suggest that broader consideration of environmental impacts beyond impingement and entrainment will also mitigate any absurdities. Riverkeeper Br. 28-29. The opposite is true. If EPA is required to "minimize," to the maximum extent technologically possible and completely without regard to costs, *every* far-flung environmental consequence associated with the location, design, and construction of cooling water intake structures, there is no end to the mischief this statutory "afterthought" will inflict. *See* Entergy Br. 50-51.

Respondents completely fail to address the "Sisyphean" consequences associated with the fact that §316(b) determinations are revisited during each permitting cycle. *Id.* at 51-52. As long as technological advances were not *de minimis*, respondents'

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597 F.2d 306, 311 (1st Cir. 1979) (citation omitted). Neither EPA nor the First Circuit suggested that the benefits of moving the intake would be *de minimis*.

interpretation could force facility operators to tear out and rebuild massive (and massively expensive) intake and cooling structures every five years, completely without regard to costs. Our country has real environmental priorities, and Congress could not possibly have intended to squander limited resources on such an absurd merry-go-round.

All told, while the Second Circuit's "cost-effectiveness" test had no textual basis and is defended by no one, at least its "99-101 fish"/"102 fish" rule was comprehensible. Respondents' interpretation, on the other hand, is an internally inconsistent smorgasbord of platitudes and *legalpolitik*. Clearly, the plain meaning of the few words in §316(b) is not the edifice constructed by respondents, leaving §316(b), at a minimum, ambiguous.

II. THE STRUCTURE AND HISTORY OF THE CWA SUPPORT PETITIONERS' READING

A. The Other Provisions Cross-Referenced In §316(b) Support, And Certainly Do Not Preclude, Cost-Benefit Analysis Under §316(b)

Respondents once agreed that the decisional framework Congress established for the other "best technology" standards in the CWA should inform the proper interpretation of §316(b). *See* Entergy Br. 38 & n.14. Now they back away and emphasize §316(b)'s uniqueness. *See* States Br. 32; Riverkeeper Br. 37 n.19. But whether the similarities or the differences are emphasized, the overall structure of the CWA supports EPA's authority to consider costs and benefits under §316(b).

Respondents' principal argument is that the BAT and BADT standards should be interpreted to prohibit all cost-benefit comparisons after 1977, because Congress wanted to shift the regulatory focus away from "water quality" toward eliminating all pollutant discharges. But §316(b) states a different goal, framed in terms of "adverse ... impact" on the "environment[]," which must include the waterbody itself. 33 U.S.C. §1326(b). Even if the CWA's general trend away from consideration of water quality as a preferred basis for regulation of discharges were taken to be inconsistent with cost-benefit comparisons, §316(b) is a conspicuous *exception*. As Respondent States concede (at 37), under "section 316(b), the impact on fish and wildlife is the paramount concern." Congress's use of the far more flexible word "minimize" instead of "eliminate," and the requirement that intake structures merely "reflect[]" BTA rather than "appl[y]" it, underscores §316(b)'s uniqueness. *Compare* 33 U.S.C. §§1311(b)(1)(A), (b)(2)(A), (b)(2)(E), 1316 (requiring "application" of BPT, BAT, BCT, and BADT) *with* 33 U.S.C. §1326(b). Respondents' principal arguments therefore simply have no purchase on §316(b)'s unique terms.

Respondents also never provide any convincing explanation for why, if analogies are to be drawn, EPA must analogize §316(b) to BAT or BADT rather than to BPT, BCT, or §316(a). *See* Entergy Br. 44-46. Respondents acknowledge, for example, that the other provisions directed at water quality objectives generally do permit cost-benefit balancing. *See* Riverkeeper Br. 37-38 (discussing §302, 33 U.S.C. §1312, reproduced in addendum hereto); *see also* §316(a). Respondents ignore the fact that the rest of

the CWA demonstrates *zero* desire on Congress's part to protect every possible fish without regard to its environmental significance. Respondents' absolutist interpretation would turn §316(b) into a radical outlier, requiring massive expenditures to save every possible fish from impingement and entrainment regardless of cost when the rest of the Act expressly tolerates the impacts to individual fish (by, for example, conventional or thermal pollution) so long as a "balanced population" is maintained. *See* Entergy Br. 44-46; *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 133 (2000) ("A court must ... interpret the statute 'as a symmetrical and coherent regulatory scheme,' and 'fit, if possible, all parts into an harmonious whole.'") (citations omitted).[9] And respondents note that the BPT provision was originally designed to sunset and be replaced by BAT in 1983, but never explain why that makes BAT a better guide for interpreting §316(b)—which took effect in 1972.

If this Court chooses to reach the proper interpretation of the BAT and BADT standards, it should hold that they leave EPA discretion to compare costs and benefits. Respondents call that interpretation "extraordinary" and a "radical notion," Riverkeeper Br. 35-36, but it is the holding of the leading court of appeals case. *See Weyerhaeuser*, 590 F.2d at 1045-46.

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[9] Respondents' interpretation becomes even more implausible when other statutes are considered. For example, Congress has *mandated* cost-benefit analysis under the Safe Drinking Water Act, 42 U.S.C. §300g-1(b)(3)(C). *See Branch v. Smith*, 538 U.S. 254, 281 (2003) (courts must interpret statutes "in the context of the *corpus juris* of which they are a part, including later-enacted statutes").

Respondents believe that because Congress expected the BAT and BADT effluent standards to be more stringent than those adopted under BPT, there must be some judicially enforceable hook in the statute to hold EPA to that expectation—such as an implicit complete ban on cost-benefit comparisons. But this Court has recognized that BAT is only "*potentially* more technology-forcing" than BPT. *Chem. Mfrs. I*, 470 U.S. at 128 n.18 (emphasis added). Congress was entitled to trust that the agency specifically constituted to protect the environment would believe in that mission. Indeed, it has exempted EPA from most of the procedural requirements of NEPA for precisely that reason. *See, e.g., Weyerhaeuser*, 590 F.2d at 1051-52 ("In essence, Congress was convinced that EPA's internal dynamics and procedures were the 'functional equivalent' of the NEPA duties imposed on other agencies."). And the statutory goal requiring continual progress toward the elimination of all pollutants provides a more than sufficient framework for ensuring that BAT would be more stringent than BPT, without inventing a prohibition on all cost-benefit comparisons that would be in great tension (at least) with the text, as well as terrible policy.

Contrary to respondents' suggestion that Congress struck all the difficult policy balances itself and merely left the implementation to EPA, this Court has consistently described the CWA as a statute that "envisioned, rather than curtailed, the exercise of discretion." *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 316-17 (1982). When Congress has already "decided the order of priorities" and mandated an outcome "whatever the cost," federal courts lack their traditional equitable powers. *TVA v. Hill*, 437 U.S.

153, 184-88, 193-95 (1978). This Court held the opposite is true under the CWA in *Weinberger*. This Court's other decisions interpreting the CWA similarly emphasize the broad discretion that Congress gave to EPA. *See Arkansas v. Oklahoma*, 503 U.S. 91, 108 (1992) ("[R]ather than establishing the categorical ban ... the [CWA] vests in the EPA and the States broad authority."); *Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 495 (1987) (holding state nuisance suits were preempted by CWA where they could interfere with "weighing of the costs and benefits" of another state or EPA); *id.* at 497 (CWA created "process whereby [competing] interests will be considered and balanced by the source State and the EPA"); *Chem. Mfrs. I*, 470 U.S. at 132-33 (holding that EPA's authority to "temper[] [CWA] with ... flexibility" conflicted with "neither the goals nor the operation of the Act").

Against all that authority, respondents repeatedly invoke a single sentence of *dictum* from *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64, 71 (1980), indicating only that cost-benefit analysis is *not required* for BAT. *See* Entergy Br. 41-42. Indeed, *Crushed Stone* recognized as much when it went on to explain that "[BAT] does not state that costs *shall* be considered in relation to effluent reduction." 449 U.S. at 71 n.10 (emphasis added); *see also* Stephen Breyer, *Regulation and Its Reform* 265 (1982) (CWA "leaves to the administrator the definition and application of these terms [BPT and BAT]. The EPA has examined the economic circumstances of the particular industry and firm, *tailoring its standards to prevent obvious*

waste." (emphasis added)).[10] And, in any event, *Crushed Stone* predates *Chevron*, and must be read in light of that later decision on statutory interpretation.

Respondents' emphasis on *Whitman v. American Trucking Ass'ns*, 531 U.S. 457 (2001), simply assumes their conclusion. The Clean Air Act provision in *Whitman* specifically required EPA to set ambient air quality standards "'requisite to protect public health'" with "'an adequate margin of safety.'" *Id.* at 465 (citation omitted). This Court reasonably concluded that EPA could not rely on cost-benefit considerations to set standards that flatly violated that directive. Respondents pretend that petitioners are similarly suggesting that EPA adopt an interpretation of §316(b) that would not require the "best technology available for minimizing adverse environmental impact." But this case is about what that standard *means*, not whether EPA must comply with it. Section 316(b)'s language is substantially more flexible and consistent with cost-benefit comparisons than the provision considered in *Whitman*. *See id.* at 490 (Breyer, J., concurring) ("[W]e should read silences or ambiguities in the language of regulatory statutes as permitting, not forbidding, this type of rational regulation.").

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[10] Similarly, Riverkeeper makes much of Senator Muskie's statement that, in determining BAT, "'the Administrator is *expected* to apply the same principles involved in making the determination of [BPT], except as to cost-benefit analysis.'" Riverkeeper Br. 36 (citation omitted) (emphasis altered). But Senator Muskie clarified his position just a few sentences later when he noted that, with respect to BAT, "'[w]hile cost should be a factor in the Administrator's judgment, no balancing test will be *required*.'" States Br. 40 (citation omitted) (emphasis altered).

Finally, respondents invoke *Russello v. United States*, 464 U.S. 16 (1983), to suggest that the inclusion of cost-benefit language in other CWA provisions means that Congress intended to preclude cost-benefit comparisons under §316(b). That canon is inapposite here. Unlike other CWA technology standards, §316(b) is brief and says *nothing* about the criteria or framework for decision that EPA should use, beyond the bare "best technology" language that, everywhere else in the CWA, provides only a label rather than the substantive content. (BPT and BADT, for example, both include the words "best," "practicable," or "available"—but in respondents' view one mandates, and the other forbids, cost-benefit comparisons.) When a statute erects what is obviously a term of art without any definition, the natural inference is that Congress intended the agency to fill the gap. Section 316(b) is also unique in several ways that militate against applying the *Russello* presumption. *See* Entergy Br. 42-46, *supra* at 16; *Clay v. United States*, 537 U.S. 522, 532 (2003) ("'The *Russello* presumption ... grows weaker with each difference in the formulation of the provisions under inspection.'") (citations omitted).

B. Respondents Misconstrue The Relevant Legislative History

Respondent States admit (at 38) that the legislative history "is sparse and undeserving of *any* significant weight." (Emphasis added.) Riverkeeper agrees that examination of the legislative history is not "necessary for this Court's resolution of the question presented," Riverkeeper Br. 5 n.3, but nonetheless offers an "extensive" but misleading discussion of the legislative history. For reasons explained by UWAG, the handwritten staff notes and other materials that

Riverkeeper unearths from the National Archives are not legitimate legislative history at all, and should be wholly disregarded. *See* UWAG Reply Br. 20-22. Regardless, neither those materials nor the valid legislative history (principally concerning the effluent provisions) remotely support the inferences that respondents attempt to draw.

Respondents claim that "[a] central issue" in the congressional debate was "the extent to which Congress should delegate to EPA the authority to consider and compare costs with benefits in determining technology-based standards." Riverkeeper Br. 7; *id.* at 5 n.3. But, as Riverkeeper's own citations reveal, this "central debate" was not, in fact, about whether EPA should be allowed to weigh costs and benefits. It was about whether the discharge of pollutants should be regulated by water quality standards or by effluent limitations. *See id.* at 8. Riverkeeper argues that technology standards prevailed over water quality standards for CWA provisions governing effluent discharges. But there is no reason why technology-based standards are necessarily incompatible with cost-benefit comparisons, as the BPT and BCT provisions demonstrate. Regardless, Riverkeeper fails to acknowledge that §316(b) is *not* an effluent discharge provision and is framed explicitly in terms of environmental "impact," including impact on the waterbody. *Supra* at 15-16.

As respondents concede, the legislative history of §316 generally reveals that "[t]he House and the Senate were, at the outset, focusing largely on the impact of *thermal discharges*," and not on cooling water intake structures. Riverkeeper Br. 12; *see also* States Br. 41-42. Although Riverkeeper suggests that

Congress shifted its focus, the 25 pages of drafts, memos, and hand-written notes it lodged with the Court collectively contain only *seven sentences* that mention or relate in any way to cooling water intake structures. *See* Riverkeeper Br. 13 n.8 (citing National Archives documents[11]). None establishes any consensus, even among the legislative staff, that cost-benefit comparisons should be precluded. And Riverkeeper has cherry-picked these documents; the weight of the materials contained in the "316 file," and elsewhere at the National Archives, confirm that the conferees remained almost exclusively focused on the thermal discharge issues and hardly discussed intake structures.[12] In sum, the documents stored at the National Archives, if relevant at all, at most confirm the Second Circuit's observation that regulation of cooling water intake structures was the product of an "afterthought."

The debate between the House and the Senate over whether to regulate thermal discharges through water quality standards or effluent limitations ultimately led to the compromise set forth in §316(a)—whereby effluent limitations are required for thermal

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[11] All the National Archives documents discussed herein are located in Cartons 1 and 2 of Accession No. 46-75-003.

[12] *See* Sept. 14, 1972 Staff Memorandum to Senator Muskie (mentioning cooling water intake structures only once in five-page memorandum discussing proposed compromise between House and Senate on thermal discharges); Sept. 13, 1972 Memorandum from Leon Billings to Senator Muskie (discussing details of proposed compromise between House and Senate on thermal discharges without any mention of cooling water intake structures) (both memoranda available in National Archives "Thermal Pollution" file).

discharges, but variances must be granted upon a showing that the limitations are "more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made." 33 U.S.C. §1326(a). The absence of such a variance in §316(b) does not establish a conscious decision by Congress to render §316(b) more stringent than §316(a). It is at least as reasonable to infer that Congress thought a separate ecological cost-benefit variance was unnecessary in §316(b), since its core requirement is already stated in terms of ecological "impact." *See* UWAG Reply Br. 22-24, 27-30.

If anything, the conferees' strong focus on thermal pollution, and the variance compromise they adopted in §316(a), demonstrate that Congress considered and squarely rejected the closed-cycle cooling requirement that respondents now seek to impose. As respondents concede, Congress knew about closed-cycle cooling in 1972 as a proven option for reducing thermal discharges. *See* States Br. 7-8 & n.6. Nonetheless, after considerable debate Congress specified that EPA could not force a once-through cooling plant to radically reduce its thermal effluent by retrofitting to a closed-cycle system, unless doing so was necessary to ensure a "balanced population" of fish in the receiving water. A cooling water intake structure is merely the other end of the same system. Riverkeeper's suggestion (at 49) that Congress "compromised" by putting a mandatory ecological variance in §316(a) but requiring maximalist technology-forcing regulation in §316(b) thus makes no sense. It presumes that Congress took away with one hand what it had just given with the other. The fact that Congress phrased §316(b) in terms of "intake

structures" rather than "cooling systems" further confirms that it did not intend for §316(b) to mandate closed-cycle cooling through the back door.

Finally, even respondents concede that the CWA nonetheless "allowed for some 'limited cost-benefit analysis'" for effluent discharges. *See* Riverkeeper Br. 12 (citation omitted). It is unreasonable to think that a Congress implacably opposed to any consideration of water quality would have allowed—and, in some cases, required—EPA to weigh costs and benefits under the provisions governing effluents but not under §316(b), which expressly *requires* EPA to examine and evaluate the local environmental "impact" of relevant technologies.

C. The Structure And Evolution Of The Act Contradict Respondents' Arguments

Respondents also improperly deride the significance of the 1977 and 1982 Amendments, which *required* EPA to weigh costs and benefits for conventional pollutants, and authorized EPA to set less stringent standards for all but the most toxic of non-conventional pollutants as long as those standards were sufficient to ensure "'protection and propagation of a balanced population of shellfish, fish, and wildlife.'" Entergy Br. 10 (quoting 33 U.S.C. §1311(g)(2)(C)). Those amendments made clear Congress's intent both (1) to define "best technology" as that which is economically proportionate to the benefits received for all but the most toxic pollutants, and (2) not to require extraordinary measures on behalf of individual fish. It defies reason that Congress would not have wanted EPA similarly to weigh costs and benefits in determining the best technology available for cooling water intake structures under §316(b).

Respondents argue that the 1977 and 1987 amendments are irrelevant because "the question in this case is what Congress intended *in 1972*, when it enacted Section 316(b), and not in later years." Riverkeeper Br. 39-40; States Br. 36. Of course, even the 1972 version of the statute clearly authorized cost-benefit comparisons extending beyond 1977 in provisions that (like §316(b)) frame their objectives in water-quality terms. *See* 33 U.S.C. §§1312, 1326(a). Regardless, the meaning of §316(b) may be informed by subsequent amendments to the Act. *See, e.g., Dada v. Mukasey*, 128 S. Ct. 2307, 2308 (2008) ("In reading a statute, the Court must not 'look merely to a particular clause,' but consider 'in connection with it the whole statute.'") (citation omitted); *Brown & Williamson*, 529 U.S. at 143-44 (interpreting statutory language in light of six subsequent enactments because "subsequent acts can shape or focus [the act's] meanings"). The fact that Congress saw no need to amend §316(b) at the same time it amended the effluent provisions (including the toxic effluent provisions) confirms Congress's initial understanding, as applied by the EPA at the time of these amendments, that the language of §316(b) never required unreasonable expenditures on behalf of aquatic life. And the Act read as a whole plainly confirms that Congress, if it ever did ascribe to the maximalist "no fish left behind" position advanced by the Second Circuit and Respondents, has long since abandoned it in favor of reasonable regulation on behalf of balanced populations of aquatic life.

III. THIS COURT SHOULD REINSTATE THE PERFORMANCE STANDARDS AND COST-BENEFIT VARIANCE

Riverkeeper contends that the national performance standards and the cost-benefit variance cannot be upheld even if this Court holds that the Second Circuit erroneously concluded that EPA could not compare benefits with costs under §316(b). Riverkeeper argues that the Second Circuit vacated these portions of the rule on grounds not fairly included within the question presented. Riverkeeper is incorrect.

First, as to EPA's national performance standards, Riverkeeper argues that the ranges used by EPA were inappropriate because they "allowed facilities fully capable of achieving performance near the upper end of the range to choose technology to meet only the lower end." Riverkeeper Br. 31 n.16. But the Second Circuit's reasoning was dependent on the same inflexible reading of "best" at the core of its cost-benefit holding. *See* Pet.App.43a (relying on "Congress's use of the superlative 'best'" to hold that "[t]he statutory directive requiring facilities to adopt the *best* technology cannot be construed to permit a facility to take measures that produce second-best results" (emphasis in original)). And because the meaning of "best" within §316(b) is both ""essential' to the analysis' of the decisions below" and "essential ... 'to the correct disposition of the other issues' ... [it is] 'fairly comprised' by the question presented." Eugene Gressman et al., *Supreme Court Practice* 457 (9th ed. 2007) (collecting cases). Petitioners are not attempting to "smuggle additional questions into [this] case," *Norfolk S. Ry. Co. v. Sorrell*, 127 S. Ct. 799, 805 (2007),

since, unlike *Sorrell*, the meaning of "best" is "fully presented" in the question *certiorari* was granted upon, *id.*

Moreover, Riverkeeper concedes the crucial point by arguing that nothing "compels EPA to establish its BTA standards as precise single-number limitations without any flexibility or margin of error," and that the "minimization requirement ... can be satisfied by a reduction within a prescribed range or, presumably, by not harming more than a prescribed amount." Riverkeeper Br. 29, 31. Riverkeeper's gloss would eviscerate the usefulness of national performance standards stated as ranges, by requiring individualized evaluation of every plant's capability *without regard* to highly localized water quality and benefits. *Compare, e.g., Weyerhaeuser*, 590 F.2d at 1040 (noting "liberality that is already built into the system" by performance standards based on "the range of impacts considered by the Agency for the industry generally.")

Riverkeeper also argues that the performance ranges were vacated for inadequate explanation, apart from the permissibility of cost-benefit analysis. Riverkeeper Br. 53 n.24. But the Second Circuit simply held that it could not determine whether EPA used cost-benefit analysis or simply "misunderstood or misapplied cost-effectiveness analysis." Pet.App.36a-37a. In other words, EPA failed to anticipate and explain why its standards would be consistent with the Second Circuit's convoluted "99-101 fish" versus 'at least 102 fish" distinction. Pet.App.26a-28a. EPA's alleged failure to explain "'how [it] determined that the cost of closed-cycle cooling could not be reasonably borne by the industry' ... '[and that its] suite of technologies "approach[es]"'" closed cycle cooling,

Riverkeeper Br. 54 n.24 (citation omitted), both assume requirements that do not exist if EPA has authority to consider the relationship between costs and benefits.

Second, as to the cost-benefit site-specific variance, the only obstacle to reinstatement of this provision is the Second Circuit's suggestion that local weighing of costs and benefits would require permit writers to consider the quality of the receiving water. That is not persuasive for reasons explained earlier, Entergy Br. 46-49, UWAG Br. 42-57, and above, *see supra* at 15-16, 22-25. Section 316(b) is uniquely focused on issues of local "environmental impact"—including effects *on the waterbody*. *See supra* at 16. Riverkeeper now concedes that §316(b)'s language cries out for regulation tailored to local conditions. Riverkeeper Br. 32-33. *Cf. Chem. Mfrs. II*, 870 F.2d at 222 (acknowledging that fundamentally different factors variances were necessary "to ensure that the national rule [for BPT] would not be overturned simply because of the Agency's failure to consider unique plants"). It is also difficult to imagine how Riverkeeper's own *de minimis* exception could be administered without regard to local ecological conditions. A more expensive technology might have benefits that are "so minor as to be unnecessary," Riverkeeper Br. 29, in one location but not another.

Riverkeeper's suggestion (at 32 n.17) that the permissibility of *local* cost-benefit analysis is not fairly within the question presented is incorrect. The question presented embraces EPA's cost-benefit authority in determining BTA generally, and that can be performed at the national or local levels. Riverkeeper's brief eloquently demonstrates how these issues are inextricably intertwined. Its entire

argument is that weighing of costs against benefits (national or local) would be inconsistent with legislative history suggesting that Congress wanted to deemphasize consideration of waterbody characteristics. Like the meaning of "best," this issue is fully presented, essential to the lower court's reasoning and to resolving the parties' arguments, and a "'predicate to an intelligent resolution of the question presented.'" *United States v. Grubbs*, 547 U.S. 90, 94 n.1 (2006) (citation omitted); *accord supra* at 27-28.

At a minimum, even if all of respondents' arguments were accepted, the terms of the remand must be modified. Respondents conspicuously decline to defend several important aspects of the Second Circuit's reasoning, including that court's cramped "cost-effectiveness" test and its hostility to local or site-specific determinations under §316(b). *Supra* at 12-13, 29. EPA spent a decade of study in formulating the Phase II Rule. If it is forced to revisit that effort, it should not be under instructions that even respondents are now unwilling to defend.

Respectfully submitted,

ELISE E. ZOLI
Counsel of Record
KEVIN P. MARTIN
ROBERT H. FITZGERALD
ALADDINE D. JOROFF
KEVIN P. PECHULIS
GOODWIN PROCTER LLP
53 STATE STREET
BOSTON, MA 02109
(617) 570-1000

ABIGAIL HEMANI
GOODWIN PROCTER LLP
NEW YORK TIMES
BUILDING
620 8TH AVENUE
NEW YORK, NY 10018
(212) 813-8800

CHUCK D. BARLOW
ENTERGY SERVICES, INC.
308 E. PEARL STREET
JACKSON, MS 39201
(601) 969-2542

Counsel for Entergy Corp.

MAUREEN E. MAHONEY
Counsel of Record
PHILIP J. PERRY
J. SCOTT BALLENGER
CASSANDRA STURKIE
DREW C. ENSIGN
LATHAM & WATKINS LLP
555 11TH STREET, N.W.
SUITE 1000
WASHINGTON, DC 20004
(202) 637-2200

KARL S. LYTZ
LATHAM & WATKINS LLP
505 MONTGOMERY STREET
SUITE 2000
SAN FRANCISCO, CA 94111
(415) 391-0600

JOHN G. VALERI, JR.
PSEG SERVICES CORP.
OFFICE OF ENVIRONMENTAL
COUNSEL
80 PARK PLAZA, T5C
NEWARK, NJ 07102-4194
(973) 430-6298

Counsel for PSEG Fossil LLC, PSEG Nuclear LLC

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ADDENDUM

33 U.S.C. § 1312

§ 1312. Water quality related effluent limitations

(a) Establishment

Whenever, in the judgment of the Administrator or as identified under section 1314(*l*) of this title, discharges of pollutants from a point source or group of point sources, with the application of effluent limitations required under section 1311(b)(2) of this title, would interfere with the attainment or maintenance of that water quality in a specific portion of the navigable waters which shall assure protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water, effluent limitations (including alternative effluent control strategies) for such point source or sources shall be established which can reasonably be expected to contribute to the attainment or maintenance of such water quality.

(b) Modifications of effluent limitations

(1) Notice and hearing

Prior to establishment of any effluent limitation pursuant to subsection (a) of this section, the Administrator shall publish such proposed limitation and within 90 days of such publication hold a public hearing.

(2) Permits

(A) No reasonable relationship

The Administrator, with the concurrence of the State, may issue a permit which modifies the effluent limitations required by subsection (a) of this section for pollutants other than toxic pollutants if the applicant demonstrates at such hearing that (whether or not technology or other alternative control strategies are available) there is no reasonable relationship between the economic and social costs and the benefits to be obtained (including attainment of the objective of this chapter) from achieving such limitation.

(B) Reasonable progress

The Administrator, with the concurrence of the State, may issue a permit which modifies the effluent limitations required by subsection (a) of this section for toxic pollutants for a single period not to exceed 5 years if the applicant demonstrates to the satisfaction of the Administrator that such modified requirements (i) will represent the maximum degree of control within the economic capability of the owner and operator of the source, and (ii) will result in reasonable further progress beyond the requirements of section 1311(b)(2) of this title toward the requirements of subsection (a) of this section.

(c) Delay in application of other limitations

The establishment of effluent limitations under this section shall not operate to delay the application of any effluent limitation established under section 1311 of this title.

REPLY BRIEF

Nos. 07-588, 07-589 and 07-597

In the Supreme Court of the United States

ENTERGY CORPORATION, PETITIONER

v.

RIVERKEEPER, INC., ET AL.

PSEG FOSSIL LLC, ET AL., PETITIONERS

v.

RIVERKEEPER, INC., ET AL.

UTILITY WATER ACT GROUP, PETITIONER

v.

RIVERKEEPER, INC., ET AL.

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

REPLY BRIEF FOR THE FEDERAL PARTIES AS RESPONDENTS SUPPORTING PETITIONERS

GREGORY G. GARRE
Solicitor General
Counsel of Record
Department of Justice
Washington, D.C. 20530-0001
(202) 514-2217

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ON WRIT OF CERTIORARI
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REPLY BRIEF FOR THE FEDERAL PARTIES AS RESPONDENTS SUPPORTING PETITIONERS

The court of appeals held that the Environmental Protection Agency (EPA) may take cost-effectiveness but not cost-benefit considerations into account under Section 316(b) of the Clean Water Act (CWA or Act), 33 U.S.C.

1326(b). The States assert that costs may be a secondary but not a primary consideration under Section 316(b). And Riverkeeper contends that costs may be taken into account only if the environmental consequences of adopting the less expensive technology are *de minimis*. Because nothing in the statute draws any of those distinctions or otherwise unambiguously precludes consideration of the relationship between costs and benefits in establishing appropriate water-intake standards under Section 316(b), EPA's determination of how best to consider costs and benefits is entitled to deference under the principles set forth in *Chevron U.S.A. Inc.* v. *NRDC*, 467 U.S. 837, 842 (1984).

Respondents lean heavily on the text, structure, and legislative history of *different* best-technology provisions that govern the discharge of pollutants. Some of those provisions, however, expressly *require* cost-benefit analysis. Those provisions confirm that Congress regarded a comparison of costs and benefits as potentially relevant to the determination of which technology is "best." Moreover, those discharge provisions are far more specific than Section 316(b)'s single terse sentence, which confers broad gap-filling authority on the agency to determine whether and how to consider the relationship between costs and benefits in addressing the distinct and unique issue of water intake. The court of appeals erred in depriving EPA of that statutory authority.

A. The Text Of Section 316(b) Does Not Unambiguously Preclude Consideration Of The Relationship Between Costs And Benefits

Section 316(b) requires that "the location, design, construction, and capacity of cooling water intake structures reflect the *best* technology *available* [(BTA)] for *minimizing* adverse environmental impact." 33 U.S.C. 1326(b) (em-

phases added). That standard does not unambiguously preclude EPA from considering the relationship between costs and benefits—especially considering that Congress did not define any of the key statutory terms or otherwise specify the factors the agency may or must consider. See Pet. App. 20a[1]; Gov't Br. 15-18.

1. Respondents observe that "best" often means "surpassing all others in excellence," and that Section 316(b) refers to the best technology available for the goal of "minimizing" adverse environmental impact. Riverkeeper Br. 24, 25 (quoting *American Heritage Dictionary of the English Language* 173 (4th ed. 2006)); see States Br. 19. Those observations do not respond to the government's point that, as a matter of common usage, the "best" way of pursuing a goal is not necessarily the one that most single-mindedly achieves that goal at all costs. Gov't Br. 15-16. For example, the "best" way to commute to and from work might not be the quickest and most direct route on a map. That route might be more dangerous than others, more prone to traffic jams, or more expensive (for example, it might require payment of a toll). Similarly, the "best" way to win a game does not typically entail violating the rules, even if cheating would improve one's odds of winning, because the rules and other values matter as well. And the "best" way to catch fish is not necessarily the one that nets the most fish in the shortest period of time; to many, fly fishing has offsetting advantages. *Ibid.*

The States (at 26) object to the first of those examples on the ground that, if one's objective is to commute as quickly or safely as possible, the quickest or safest route is necessarily the "best" method of achieving that goal. But even if speed is the stated objective, a commuter would not

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[1] Citations to the Pet. App. refer to the appendix filed in No. 07-588.

ordinarily consider hiring a helicopter or professional race car driver or leaving home at 4:00 a.m. to be the "best" way to travel to work. And if safety is the ultimate goal, one would not ordinarily describe acquiring a tank or walking instead of driving ten miles as the "best" approach. Instead, even when a goal is defined as narrowly as commuting as quickly or safely as possible, additional practical considerations such as costs and other countervailing factors are often relevant, in daily life and ordinary English usage, to the selection of the "best" approach.

Moreover, the statute refers to the best technology "for," rather than the technology that is best "at," the achievement of the stated objective. 33 U.S.C. 1326(b). That choice of words reinforces the conclusion that EPA is authorized to take account of competing considerations in determining which technology is "best." For example, an individual regarded as the best person *at* his trade might not be the best person *for* a particular job, depending on a range of considerations. Gov't Br. 16. The States respond (at 28) that "if a particular job calls only for a person with superior skills *for* repairing shoes, then the best cobbler *at* his trade would also be the best person *for* the job." But that blinks the reality that other considerations, such as honesty and salary demands, normally matter as well.

2. In any event, Section 316(b) does not refer to the best technology for reducing adverse environmental impact "to the lowest level possible," as the States claim (at 24). Instead, the statute refers to "the best technology *available* for *minimizing* adverse environmental impact." 33 U.S.C. 1326(b) (emphases added). Even the court of appeals recognized that the availability of a particular technology depends in part on its cost. Pet. App. 24a. The court erred, however, in holding that the statute unambiguously restricts EPA to considering whether a technology's cost

could be "*reasonably borne* by the industry." *Ibid.* Even considering the term "available" in isolation, many people would not think of a luxury item as being "available" simply because its purchase would not bankrupt them. Gov't Br. 17; see Riverkeeper Br. 26 ("There is, to be sure, some potential ambiguity in terms of what the word 'available' means."). The States argue (at 28) that an item's cost is relevant to its availability only "if the person [is] not *required* to obtain the item." But that merely begs the question of what is required here.

The States also suggest (at 29) that, in determining availability, EPA might consider cost "at some secondary level," but not at "the forefront of its technology evaluation." The States' apparent recognition that costs may be considered to *some* degree, however, cannot be reconciled with their contention that Section 316(b) unambiguously precludes the approach that EPA has chosen. Section 316(b) does not distinguish, much less unambiguously distinguish, between consideration of cost as a "secondary" factor and consideration of cost as a "primary" decision-making criterion. And, absent contrary specification in the statutory text, the choice of the appropriate *degree* or *manner* of considering a permissible factor involves a classic exercise of agency discretion. See Gov't Br. 39.

Moreover, technology must be available for "minimizing" adverse environmental impact. 33 U.S.C. 1326(b). Respondents argue that "'minimize' means 'to reduce to the smallest possible number, degree, or extent.'" States Br. 19 (quoting *Webster's Third New Int'l Dictionary of the English Language* 1438 (1981)). As the government's opening brief explained (at 17), however, the terms "minimal" and "minimize" often refer to a lesser degree of reduction. Thus, if a person said that he was trying to minimize the risk of being hit by a car while crossing a street, he presum-

ably would not mean that he was staying inside his house at all times. Instead, the person presumably would mean that he was trying to reduce that risk consistent with other practical considerations—including economic ones such as the need to travel to work—and thus was taking lesser precautions such as looking both ways before crossing streets. *Ibid.*

While the States complain (at 29) that the government's opening brief cited only "a single source" for the proposition that "minimize" commonly refers to reductions that are not to the lowest possible level, that brief cited two perfectly authoritative sources: *American Heritage Dictionary* 123 (4th ed. 2006), and *Black's Law Dictionary* 1016 (8th ed. 2004). Gov't Br. 17. Another example is Riverkeeper's brief, which ultimately concedes (at 29) that "the Agency has some discretion (albeit not boundless) to determine that further differences in reduction would be so minor as to be unnecessary for compliance with the minimizing requirement." Riverkeeper thereby acknowledges that a particular technology can "minimiz[e]" environmental impacts, within the meaning of Section 316(b), even if it does not reduce those impacts to the smallest possible level.

The States also claim (at 19-20) that EPA's Phase I regulations adopt their definition of "minimize." In fact, those regulations define "minimize" to mean "to reduce to the smallest amount, extent, or degree *reasonably* possible." 40 C.F.R. 125.83 (emphasis added). Reasonableness, of course, depends on a range of considerations. See, *e.g.*, *United States* v. *Banks*, 540 U.S. 31, 35-36 (2003). Thus, EPA determined in the rulemaking below that the appro-

priate "degree" of reduction may depend in part on "the relationship between costs and benefits." Pet. App. 356a.[2]

3. The States suggest (at 22, 25) that the standard articulated in Section 316(b) is an "indivisible term of art" and that any ambiguities in the individual words are therefore irrelevant. The BTA standard, however, was by no means a term of art when Congress enacted it; instead, Congress appears to have articulated that standard for the first time in Section 316(b). And while Riverkeeper colorfully argues (at 23) that the government does not rely on "primary, secondary, or even tertiary definitions of the relevant terms," that is manifestly untrue, as discussed above. The fact that the critical statutory terms can and do take on different meanings in different contexts only underscores the statute's ambiguity. What matters, for *Chevron* deference purposes, is that nothing unambiguously compels the alternate usages proffered by respondents. See, *e.g.*, *EEOC* v. *Commercial Office Prods. Co.*, 486 U.S. 107, 115 (1988).

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[2] The States note (at 19-20) that EPA's preamble to a 1976 rule treated the term "minimizing" as referring to "reducing to the smallest possible amount or degree." J.A. 41. That rule was vacated, however, on judicial review. See *Appalachian Power Co.* v. *Train*, 566 F.2d 451 (4th Cir. 1977). The following year, EPA issued a permitting decision and a General Counsel opinion making clear the agency's view that it would *not* be "reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 & 2)*, No. 76-7, 1977 WL 22370 (EPA June 10, 1977), remanded on other grounds *sub nom. Seacoast Anti-Pollution League* v. *Costle*, 572 F.2d 872 (1st Cir. 1978); accord *In re Cent. Hudson Gas & Elec. Corp., Op. EPA Gen. Counsel*, NPDES No. 63, 1977 WL 28250, at *8 (July 29, 1977); see p. 16, *infra*. And EPA's current regulatory definition of "minimize," which was established in the Phase I rule, is the one quoted in the text.

B. The Statutory Structure, Context, And History Confirm That EPA May Consider The Relationship Between Costs And Benefits In Establishing Water-Intake Standards Under Section 316(b)

1. Section 316(b) cross-references Sections 301 and 306 of the CWA by specifying that standards established pursuant to those sections, which govern the discharge of pollutants, must require that intake structures reflect BTA. 33 U.S.C. 1326(b). Sections 301 and 306 include numerous other best-technology standards. For all of those standards, Congress expressly *required* EPA to consider costs in determining what technologies are "best." And for two of those standards, Congress specifically required EPA to consider the *relationship* between costs and benefits in identifying the "best" technologies. Gov't Br. 19-21.

Those express statutory mandates strongly support EPA's determination that consideration of the relationship between costs and benefits is *permissible* under Section 316(b). In particular, those provisions refute Riverkeeper's notion (at 21) that a comparison between costs and benefits is generally inconsistent with the application of a best-technology standard. And Congress's decision to specify the factors that EPA must consider under the various best-technology standards that govern the discharge of pollutants under Sections 301 and 306, but not under the different best-technology standard that governs the intake of water under Section 316(b), confirms that Congress intended to grant broad gap-filling authority to the agency to interpret and implement Section 316(b)'s terse and unique provision governing water intake. Gov't Br. 18-26.

Respondents fail to articulate a coherent and consistent theory as to the relevance of the cross-referenced sections to the proper interpretation of Section 316(b). They insist that, "[b]ecause section 316(b) addresses intake structures,

not effluent [discharges], it stands apart from the statutory provisions elsewhere in the Act that govern effluent limitations." States Br. 5; see *id.* at 32; Riverkeeper Br. 37 n.19; *id.* at 40 (suggesting that the Section 301 standards are "unrelated" to Section 316(b)). But they nonetheless argue at length (*e.g.*, States Br. 34-36) that, by expressly *requiring* consideration of the relationship between costs and benefits under two of the cross-referenced standards, Congress unambiguously *prohibited* such consideration under Section 316(b).

Neither of those conclusions logically follows from a comparison between Section 316(b) and the cross-referenced provisions of the Act. Each of the cross-referenced best-technology standards in Sections 301 and 306 identifies specific lists of factors that EPA must consider. And as noted, those lists expressly require cost-benefit analysis as one of multiple mandated considerations for some but not all of those standards. See 33 U.S.C. 1314(b)(1)(B), (2)(B) and (4)(B); see also Gov't Br. 19-21.

For intake restrictions, however, Congress enacted only the one-sentence Section 316(b), and it conspicuously declined to provide an additional list of factors that EPA is required, permitted, or forbidden to consider. Respondents are therefore incorrect in stating that "[t]hroughout the CWA, Congress told EPA when and how it could consider costs." States Br. 16. For water-intake limitations—unlike pollutant-discharge restrictions—Congress provided no specific direction *either way* beyond the ambiguous BTA standard. The only reasonable conclusion from that statutory scheme is that Congress thereby delegated *broader* gap-filling and interpretive authority to EPA for water-intake limitations under Section 316(b) than for pollutant-discharge restrictions under Sections 301 and 306. Gov't Br. 22-23.

The States nonetheless argue (at 35) that "the reference in section 316(b) to section 306 (the section applicable to new rather than existing facilities) confirms Congress' intent to eliminate EPA's authority to make cost-benefit comparisons when it sets new source performance standards." There is no textual basis whatsoever for treating Section 316(b)'s BTA standard for intake limits as being coextensive with Section 306's best available demonstrated control technology (BADT) standard for the discharge of pollutants from new sources. See 33 U.S.C. 1316(a)(1). Indeed, the States elsewhere acknowledge (at 33) that, in selecting different standards for the various limitations under Sections 301, 306, and 316, Congress obviously "intended to give each standard different meaning in its application." Especially considering that Section 316(b) addresses a different subject matter than Sections 301 and 306 (intake of water as opposed to discharge of pollutants) and establishes a different standard, there is no reason to believe that Congress intended to equate BTA with any one of the Section 301 or 306 standards.

There is even less basis for construing Section 316(b) as unambiguously mirroring BADT as opposed to one of the other cross-referenced standards, such as the best practicable control technology (BPT) or best conventional pollution control technology (BCT) standards—standards under which Congress expressly *required* consideration of the relationship between costs and benefits. See 33 U.S.C. 1311(b)(1)(A) and (2)(E); 33 U.S.C. 1314(b)(1)(B) and (4)(B); see also Gov't Br. 19, 20. The States contend (at 36) that Congress did not evince an "unambiguous intent" to pat-

tern BTA on BCT. But that is the government's point—the statute is ambiguous on this issue.[3]

The States also contend (at 36-37) that Section 316(*a*) does not permit consideration of the relationship between costs and benefits. That provision states that, if a Section 301 or 306 discharge limitation on heat would otherwise be "more stringent than necessary to assure the pro[t]ection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife," a permitting authority "may impose" a Section 301 or 306 limitation "that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife." 33 U.S.C. 1326(a). Section 316(a) thereby authorizes EPA and state permitting authorities to grant variances from Section 301 and 306 limitations on discharges of heat. While it is true that Section 316(a) variances are not based on cost considerations, that hardly means that Section 316(b)—which sets forth a different standard for regulating a different matter and does not cross-reference Section 316(a)—unambiguously precludes cost-benefit analysis.

2. Nor (even assuming that legislative history could ever resolve statutory ambiguity for purposes of *Chevron*) does the legislative history unambiguously demonstrate a congressional intent to preclude consideration of the relationship between costs and benefits under Section 316(b). The States argue (at 38) that "[t]he legislative history of

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[3] Because the statute does not equate BTA with BAT or BADT, there is no need to decide in this case whether EPA may consider the relationship between costs and benefits in determining BAT or BADT. Riverkeeper correctly argues (at 35-37) that EPA is not *required* to consider that relationship in making those determinations, and that BAT standards are intended to be stricter than BPT standards. But it does not necessarily follow that *no* cost-benefit consideration is *permitted* for either BAT or BADT. See Gov't Br. 23-24.

section 316(b) is sparse and undeserving of any significant weight." The government generally agrees. Section 316(b) was "added by the conference committee without substantive comment." *Riverkeeper, Inc.* v. *United States EPA*, 358 F.3d 174, 186 n.12 (2d Cir. 2004) (*Riverkeeper I*). And while the only floor statement concerning Section 316(b) supports EPA's interpretation, that statement reflects the views of a single legislator, Representative Clausen. See Gov't Br. 23; 118 Cong. Rec. 33,762 (1972).

Like the States, Riverkeeper (at 47) also disclaims reliance on legislative history, but then goes on to discuss at length the legislative history of *other* provisions of the CWA. Riverkeeper's basic argument (at 6-12, 47-49) is that, by choosing to rely primarily on technology-based discharge standards rather than water-quality standards, Congress rejected cost-benefit analysis in the CWA. But Congress's reasons for generally preferring technology-based discharge standards (which directly address discharges as opposed to water bodies) to water-quality standards (which directly address water bodies as opposed to individual discharges), see generally *EPA* v. *California*, 426 U.S. 200, 202-203 (1976), do not imply any particular view as to whether EPA should consider the relationship between costs and benefits in formulating appropriate standards. That is evident on the face of the BCT and BPT standards, which are technology-based discharge standards that expressly *require* consideration of the relationship between costs and benefits. See p. 10, *supra*.

Moreover, the legislative history proffered by respondents relates almost entirely to discharges of pollutants governed by Sections 301, 306, and 316(a), not to water intakes governed by Section 316(b). The States are clear on that point: after discounting the legislative history of Section 316(b) on the ground that it consists of only a floor

statement, the States go on to rely on legislative history—mostly floor statements, ironically—concerning other provisions of the Act. States Br. 38-41. Going even farther afield, Riverkeeper searched the National Archives for various notes, memoranda, and correspondence that, it claims, show that the conferees decided to address thermal discharges with a water-quality based variance (in Section 316(a)) and water intake through a best-technology standard (in Section 316(b)). Riverkeeper Br. 10 n.6, 13 n.8. That much is obvious on the face of the statute. But none of the materials on which respondents rely tackles the question presented here, which is whether Section 316(b)'s best-technology standard precludes, permits, or (like BPT and BCT) requires consideration of the relationship between costs and benefits. And even if the assorted materials relied on by Riverkeeper were on point, and even if they were considered reliable and relevant sources of legislative history, they could hardly establish an *unambiguous* congressional intent—especially considering that Representative Clausen's floor statement, which is at least a more conventional form of legislative history, supports EPA's interpretation.

Respondents' discussion shows only that Section 316(b)'s intake provision received very little consideration in the legislative debates, especially compared to the Section 301, 306, and 316(a) discharge restrictions. But, if anything, that undercuts respondents' position because the gravamen of their argument is that Congress in enacting Section 316(b) specifically "determined the relationship between the costs and benefits." States Br. 44. If that were true, one would expect at least *some* indication that Congress had actually considered the question and had determined that the benefits of applying respondents' proposed water-intake standard justified the costs. As the

Second Circuit explained in *Riverkeeper I*, however, the "brevity" of Section 316(b), combined with the "paucity of legislative history, when measured against the volumes of drafts and speeches devoted to other aspects of the 1972 amendments," suggests that Congress "desire[d] to delegate significant rulemaking authority to the Agency." 358 F.3d at 186 n.12.

C. The Court Of Appeals Erroneously Usurped EPA's Discretion

Because Section 316(b) does not "directly sp[eak] to the precise question at issue," EPA's reasonable interpretation of the ambiguous statutory text is entitled to deference. *Chevron*, 467 U.S. at 842; see Gov't Br. 26-30.

1. The court of appeals turned normal principles of *Chevron* deference on their head by relying on an artificial presumption that cost-benefit analysis is forbidden unless Congress clearly authorizes it. See Pet. App. 22a-23a. Respondents do not appear to defend that presumption, see Riverkeeper Br. 41-42; States Br. 43, and for good reason: Congress's *silence* on whether an agency may consider the relationship between costs and benefits provides no basis for inferring an unambiguous legislative *prohibition* against such consideration. Gov't Br. 30-34. "[S]ilence, after all, normally creates ambiguity. It does not resolve it." *Barnhart* v. *Walton*, 535 U.S. 212, 218 (2002). The court of appeals' presumption is especially unwarranted because, far from being aberrational, cost-benefit analysis instead is a routine feature of private and governmental decision-making. See Gov't Br. 13-14.

2. The extent of the court of appeals' departure from normal deference principles is further underscored by its attempt to micro-manage EPA's decisionmaking through rules that cannot be found in the Act. The court concluded,

for example, that EPA may consider costs as part of "cost-effectiveness" but not "cost-benefit" analysis—terms that appear nowhere in Section 316(b). See Pet. App. 24a, 26a. Based on that atextual distinction, the court would have allowed EPA to adopt a significantly cheaper technology that would save 99-101 fish instead of 100-103 fish. *Id.* at 22a-23a & n.10, 27a. By permitting the agency to weigh costs against at least one or two fish (and perhaps more, though the number is unclear), the court of appeals essentially permitted EPA to consider the relationship between costs and benefits, but only in the most extreme cases. Even on its own terms, therefore, the court of appeals' decision lacks a principled basis in the statutory text. Moreover, the court of appeals agreed that EPA could consider other practical factors such as energy efficiency that, while important, are no more grounded in explicit statutory text than the relationship between costs and benefits. See *id.* at 26a n.12.

While respondents do not directly address those points, their own positions rest on similar errors. The States (at 16, 21, 29) repeatedly assert that costs can be a "secondary" but not a "primary" consideration under Section 316(b). That approach has no more grounding in the statute than the court of appeals' cost-benefit/cost-effectiveness distinction. And as noted above, the States' embrace of cost as a secondary factor only underscores that EPA is entitled to deference, because the precise manner or extent of considering a permissible factor is a textbook matter for agency discretion. See p. 5, *supra*.

Similarly, Riverkeeper concedes (at 29), in the course of assuring this Court that its position would not produce absurd results, that "the Agency has some discretion (albeit not boundless) to determine that further differences in reduction would be so minor as to be unnecessary for compli-

ance with the minimizing requirement." But there is no more principled basis for cabining EPA's conceded discretion to "minor" (*ibid.*) matters than for limiting it to cost-effectiveness or "secondary" considerations. Congress expressed no unambiguous intent to draw any of those proffered distinctions.

3. Riverkeeper argues (at 43-44) that the agency's interpretation is not entitled to *Chevron* deference because, in the preamble to a 1976 rulemaking that was vacated on judicial review, EPA initially construed Section 316(b) to preclude cost-benefit analysis. That characterization is neither correct nor relevant (especially considering that the rule was vacated, see *Appalachian Power Co.* v. *Train*, 566 F.2d 451 (4th Cir. 1977)). EPA determined in the 1976 preamble that cost-benefit analysis is not "required," but it did not squarely address whether consideration of the relationship between costs and benefits is permitted. Instead, in a portion of the preamble that Riverkeeper does not discuss, the agency emphasized that "economic practicability" is an important consideration that should be analyzed on a case-by-case basis. J.A. 42.

The following year, in a permitting decision and a General Counsel opinion, EPA explained that, while Section 316(b) does not require a formal cost-benefit analysis, it would *not* be "reasonable to interpret Section 316(b) as requiring use of technology whose cost is wholly disproportionate to the environmental benefit to be gained." *In re Pub. Serv. Co. of N.H. (Seabrook Station, Units 1 & 2)*, No. 76-7, 1977 WL 22370 (EPA June 10, 1977) (*Pub. Serv. Co. of N.H.*), remanded on other grounds *sub nom. Seacoast Anti-Pollution League* v. *Costle*, 572 F.2d 872 (1st Cir. 1978); accord *In re Cent. Hudson Gas & Elec. Corp., Op. EPA Gen. Counsel*, NPDES No. 63, 1977 WL 28250, at *8 (July 29, 1977). Ever since, permitting authorities in imple-

menting Section 316(b) have considered the relationship between costs and benefits to at least that extent. Gov't Br. 27-28.

Riverkeeper contends (at 45) that EPA, in applying the "wholly disproportionate" test, has considered only whether the benefits of additional protective measures would be *de minimis*. That gloss, however, is flatly inconsistent with the test as EPA has articulated it: EPA directed permitting authorities to determine whether "*cost* is wholly *disproportionate* to the environmental *benefit* to be gained," not whether the benefit is *de minimis*. *Public Serv. Co. of N.H.*, 1977 WL 22370 (emphases added). The court of appeals' decision is thus incompatible with more than 30 years of settled agency practice. See also, *e.g.*, *In re Florida Power Corp. Crystal River Power Plant Units 1, 2, & 3*, NPDES Permit No. FL0000159, at 7-8 (EPA Region IV Sept. 1, 1988) (determining that closed-cycle cooling towers were not BTA because their extremely high cost was "wholly disproportionate" to benefits at a particular plant, even though that technology would reduce entrainment by 85% and there were no other technologically practical alternatives to reduce entrainment "to an acceptable level" at the plant).

Riverkeeper is likewise incorrect in contending (at 45-46) that EPA recognized during the Phase I rulemaking for new sources that "it lacked authority to compare costs and benefits under Section 316(b)." As the government's opening brief explained (at 38-39), the Phase I rule rejected a technology known as dry cooling because, among other things, dry cooling "costs more than ten times as much per year as closed-cycle wet cooling, but it is estimated to reduce water intake by only an additional 5 percent relative to once-through cooling." *Riverkeeper I*, 358 F.3d at 194 (footnotes omitted). The Second Circuit upheld EPA's con-

sideration of the relationship between costs and benefits, along with other factors, as falling within the agency's "considerable discretion." *Id.* at 195. Riverkeeper makes no effort to reconcile its characterization of the Phase I rulemaking with those facts.

D. EPA's Consideration Of Costs And Benefits In The Rulemaking At Issue Here Fell Well Within Its Discretion

Because EPA acted within the scope of its statutory authority in promulgating the performance standards and site-specific cost-benefit variance provision at issue here, this Court should reverse the judgment of the court of appeals and reinstate those portions of the rule. Although respondents dispute EPA's authority to give any weight to the relationship between costs and benefits, they raise no substantial challenge to the specific manner in which EPA considered that relationship here.

Nor could they. EPA did not select the performance standards based only on a cost-benefit analysis. Instead, the agency rejected closed-cycle cooling technology as BTA "based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations." Pet. App. 255a; see Gov't Br. 35-37. The cost-benefit variance provision likewise does not turn on a strict cost-benefit comparison. Instead, it permits the operator of an individual facility to apply for a site-specific determination of BTA—which itself would be based on a permitting authority's discretionary consideration and balancing of all relevant factors—only if the facility's cost of complying with the national performance standards "would be *significantly* greater than the benefits." 40 C.F.R. 125.94(a)(5)(ii) (emphasis added); see Gov't Br. 39-41. As the government's

opening brief explained (at 14), agencies' consideration of the relationship between costs and benefits may take a number of different forms. EPA's consideration of various relevant factors in the rulemaking below was by no means among the more robust types of cost-benefit analysis.[4]

Riverkeeper observes (at 52) that EPA "assigned no dollar value" to many of the relevant benefits "because it was too difficult to determine a meaningful [monetary] value for them." The agency did, however, undertake a "qualitative[]" analysis of the benefits that were not quantified. Pet. App. 485a; see *id.* at 482a-515a. EPA ultimately concluded that, "[a]lthough not identical, the ranges of impingement and entrainment reduction are similar under both" the cooling-towers option and the selected option, while the costs of the former far exceed those of the latter. *Id.* at 260a. Far from reflecting a defect in EPA's analysis, the agency's conclusion that it would make little sense to try to compare all relevant considerations in purely *monetary* terms demonstrates the flexibility and common-sense nature of cost-benefit analysis.

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[4] The States assert (at 8) that EPA has found closed-cycle cooling to be BTA "at more than a dozen existing power plants." That is incorrect. In both of the examples cited by the States, power plants were retrofitted with closed-cycle cooling technology to reduce thermal discharges pursuant to Section 316(*a*). See *Consolidated Edison Co.* v. *New York State Dep't of Envt'l Conservation*, 726 F. Supp. 1404, 1406 (S.D.N.Y. 1989); *California's Coastal Power Plants: Alternative Cooling System Analysis* 6-2 (visited Oct. 27, 2008) <http://www.resources.ca.gov/copc/OTC/Chapter_6_Retrofit_and_Repower_Examples_28121840.pdf>. Some other facilities have been retrofitted for operational, not pollution-related, reasons. See *id.* at 6-2, 6-3, 6-4. The States' reliance (at 7) on the preamble to the vacated 1976 rule is likewise misplaced, not only because the rule was vacated, but also because that preamble explained that closed-cycle cooling is *not* "universally and necessarily the best technology available," and that BTA should instead be determined on a facility-specific basis. J.A. 43.

Respondents do not appear to dispute that the validity of the cost-benefit variance depends entirely on the resolution of the question presented. See Gov't Br. 40-41. Riverkeeper contends (at 53 n.24), however, that the court of appeals' invalidation of the performance standards rests on the alternative ground that EPA did not adequately explain the basis for its decisionmaking. But what the court considered unclear is whether the agency "based its decision on permissible cost-effectiveness analysis or exceeded its authority by relying impermissibly upon a cost-benefit analysis." Pet. App. 36a. Because that conclusion rests entirely on the court of appeals' erroneous holding that EPA may not consider the relationship between costs and benefits, it does not provide an independent basis for a remand to the agency.

Riverkeeper further contends (at 31 n.16) that the court of appeals invalidated EPA's performance standards on the (assertedly) separate ground that they allowed facilities that could comply with the upper end of a range to comply with the lower end instead, and that the validity of the ranges is not fairly included in the question presented. As the government's opening brief explained (at 39 n.3), however, the court remanded EPA's chosen ranges based on its view that Section 316(b) requires "as much reduction of adverse environmental impacts as is technologically possible." Pet. App. 43a. Because that holding rests on the court's erroneous resolution of the question presented, and Riverkeeper acknowledges (at 31 n.16) that ranges are otherwise permissible, the court's invalidation of the ranges is fairly encompassed in the question presented and should be reversed.

* * * * *

For the foregoing reasons and those stated in the government's opening brief, the judgment of the court of appeals should be reversed with respect to the performance standards and the site-specific cost-benefit provision, those provisions should be reinstated, and the case should be remanded.

Respectfully submitted.

GREGORY G. GARRE
Solicitor General

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REPLY BRIEF

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IN THE

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ENTERGY CORP.,
PSEG LLC and PSEG NUCLEAR LLC, and
UTILITY WATER ACT GROUP,
Petitioners,

v.

RIVERKEEPER, INC., *ET AL.*,
Respondents.

On Writs of Certiorari to the United States Court of Appeals for the Second Circuit

REPLY BRIEF OF PETITIONER UTILITY WATER ACT GROUP

KRISTY A. N. BULLEIT
Counsel of Record
HUNTON & WILLIAMS LLP
1900 K STREET, N.W.
WASHINGTON, DC 20006
(202) 955-1547
Counsel for Petitioner

October 28, 2008

WILSON-EPES PRINTING CO., INC. – (202) 789-0096 – WASHINGTON, D. C. 20002

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RULE 29.6 STATEMENT

Pursuant to Rule 29.6, there is no change to the corporate disclosure statement previously filed by the Utility Water Act Group.

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ARGUMENT

This is the reply of petitioner Utility Water Act Group (UWAG) to the briefs of Riverkeeper, Inc. *et al.* and the Northeast States Connecticut, Delaware, Massachusetts, New Jersey, New York, and Rhode Island, as well as to the *amicus* briefs supporting them.[1]

As shown in UWAG's opening brief, nothing in the language, structure, or legislative history of §316(b) limits the types of environmental impacts EPA may consider or the tools it may use to decide which impacts are "adverse." UWAG 28, 32-34. Moreover, nothing prohibits EPA from comparing a wide range of "costs" and "benefits" to decide when "adverse environmental impacts" have been "minimized." *Id.* Nor does the statute or its history forbid EPA to authorize alternative §316(b) requirements based on site-specific costs and benefits. *Id.* 27, 42-57. Therefore, EPA's interpretation of §316(b) to authorize comparing costs and benefits when selecting "best technology available for minimizing adverse environmental

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[1] We will refer to the briefs of parties and *amici* as Solicitor General (SG); Entergy Corp. et al. (Entergy); Riverkeeper, Inc. et al. (Riverkeeper); Connecticut et al. (NEStates); National Wildlife Federation et al. (NWF); State of Illinois et al. (State *Amici*); Voices of the Wetlands et al. (VoW); Environmental Law Professors (Envtl. Law Professors); Commercial Fishermen of America et al. (CFoA); and Ackerman et al. (Ackerman).

impact" at both the national and local levels was reasonable and entitled to deference.

Respondents and their *amici* do not refute these arguments. In fact, neither respondent even attempts to answer UWAG's arguments in defense of EPA's rule authorizing alternative standards when costs at a site are significantly greater than benefits (UWAG 42-57). Instead, Riverkeeper suggests that this issue concerns EPA's general authority to set site-specific requirements, as opposed to categorical industrywide ones, and urges the Court to ignore it. Riverkeeper 32 n.17.

Although Riverkeeper is correct that EPA's general authority to allow site-specific §316(b) requirements is not at issue,[2] its authority to allow site-specific requirements *based on cost-benefit analysis* clearly is. The petitions for certiorari raised this issue,[3] and it falls squarely within the cost-benefit issue on which the Court granted certiorari.

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[2] The Second Circuit has twice concluded that §316(b) authorizes site-specific requirements. *Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 111 n.22 (2d Cir. 2007), *cert. granted, in part*, 128 S. Ct. 1867 (U.S. 2008) (No. 07-588); *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 193 (2d Cir. 2004); UWAG 43-44. Nevertheless, the Second Circuit set aside the Phase II provision authorizing alternative limits based on costs and benefits because it concluded, as it had for the national standards, that comparing costs and benefits is not allowed.

[3] UWAG Petition for Writ of Certiorari 9-10 (Nov. 2, 2007); UWAG Reply 10 (Mar. 18, 2008); PSEG Petition for Writ of Certiorari 9-10 (Nov. 2, 2007).

See Riverkeeper, Inc. v. EPA, 475 F.3d 83 (2d Cir. 2007), *cert. granted, in part*, 128 S. Ct. 1867 (U.S. 2008) (No. 07-588). Riverkeeper's assertion to the contrary is an attempt to avoid arguments for which it has no rebuttal.

I. Nothing in the Words "Best Technology Available for Minimizing Adverse Environmental Impact" Prohibits Comparing Costs to Benefits

Both Respondents concede that EPA has authority to consider cost in *some* fashion, even though §316(b) does not mention cost. Riverkeeper 26-27; NEStates 21. And neither disputes that EPA may consider an intake technology's "benefits," as long as they reduce impacts to individual organisms and no attempt is made to "value" the organisms in terms of their contribution to the economy or the health or productivity of a waterbody. *See* Riverkeeper 26-27; NEStates 35-36.

Nevertheless, Respondents argue that the "plain language" of §316(b) forbids any economic evaluation of environmental impacts and any comparison of costs and benefits for purposes of selecting "best technology available for minimizing adverse environmental impact." They argue that "best" and "available" must be interpreted in light of "minimizing adverse environmental impact."[4] They

[4] They also argue that only their preferred dictionary definitions of "best," "available," and "minimize" are reasonable. As Entergy's reply at Section I shows, they are wrong.

argue that the result Congress intended by this objective is clear from the words. Riverkeeper 23-24; NEStates 19-20. Yet even they do not agree on what "minimizing adverse environmental impact" means, and neither explains why "plain language" compels its preferred interpretation. Nor do respondents provide evidence that Congress intended to prohibit the broad, flexible cost-benefit comparisons EPA performed and authorized here.

The Northeast States believe "minimizing adverse environmental impact" means minimizing the killing and injuring of individual fish and other aquatic life as much as technologically possible. NEStates 15. They do not mention, nor do they apparently believe, that §316(b) allows EPA to strike a balance, even in noneconomic terms, between reducing risks to aquatic organisms and increasing other environmental impacts.

In contrast, Riverkeeper never reveals what it thinks "adverse environmental impact" means, although it concedes at 28-29 that the term is broad enough to encompass nonaquatic environmental effects. Instead, Riverkeeper simply asserts that cost-benefit analysis cannot be used to distinguish "adverse environmental impact" from "permissible impact." *See* Riverkeeper 26. While agreeing with the Northeast States that "costs" and "benefits" can never be compared to determine when "adverse environmental impact" has been minimized, Riverkeeper carves out so many exceptions as to virtually negate the argument.

As UWAG has demonstrated, nothing in the words Congress chose compels the conclusion that Congress intended a single-minded focus on reducing impingement and entrainment at all costs. UWAG 33-34. Moreover, nothing in §316(b) limits EPA's discretion to decide how to measure and weigh costs and benefits in deciding which technology is "best available" for "minimizing adverse environmental impact." EPA's interpretation of §316(b) is consistent with a natural reading of the words Congress used, as their dictionary definitions show. *Id.*

Respondents make no effort to show why "adverse environmental impact" means only what they say it does or why costs and benefits cannot be compared in determining which available technology is best. Rather, they rely on unsupported, and often inconsistent, assertions.

A. Riverkeeper's Argument That the Statutory Objective Precludes Comparison of Costs and Benefits Is Unsupported and Internally Inconsistent

1. Riverkeeper's Argument Rests on an Interpretation of "Adverse Environmental Impact" That It Neither Reveals Nor Supports

Nowhere does Riverkeeper parse the phrase "adverse environmental impact" or offer a plausible explanation why that phrase, by its terms, precludes

cost-benefit comparisons. Instead, Riverkeeper avoids the issue, suggesting that the Court should not construe "adverse environmental impact" at all. Riverkeeper argues that "[t]he full range of 'adverse environmental impacts' EPA can consider and the weight each is assigned are not before the Court." Riverkeeper 29 n.14.

This argument is internally inconsistent, because Riverkeeper and the States agree that the object of "minimizing adverse environmental impact" is relevant to interpreting other words like "best," "available," and "minimize." And it is absurd, because a court must construe statutory provisions as a whole, not piecemeal. *Nipper v. Smith*, 39 F.3d 1494, 1515 (11th Cir. 1994), *citing Massachusetts v. Morash*, 490 U.S. 107 (1989).

2. Riverkeeper Relies on a False Premise About the Type of Cost-Benefit Comparison EPA Applied

Riverkeeper argues that *any* comparison of costs and benefits is inconsistent with the objective of "minimizing adverse environmental impact," because "cost-benefit analysis" is based on "the policy premise that the cost of reduction *should not be greater than the corresponding benefits.*" Riverkeeper 26 (emphasis added). Riverkeeper assumes that the broad, flexible cost-benefit comparison EPA made in setting the national standards, and authorized permit writers to make in setting alternate standards, is the mathematically

precise, purely economic cost-benefit equation that Riverkeeper describes. Many of the arguments made by respondents' supporters have the same misperception about what EPA did.[5]

EPA's comparison of costs and benefits at the national level involved both qualitative and quantitative balancing of a wide range of environmental, energy, and economic costs against environmental, economic, and social benefits. UWAG 51-57; SG 6-7. Rather than requiring that benefits exceed costs, EPA issued a final rule for which the quantifiable economic costs were almost five times the quantifiable economic benefits. UWAG 21; Pet.App. 526a. Similarly, for site-specific standards, the Phase II rule allows alternative standards only where costs are "significantly" greater than benefits. Clearly, EPA did not use "benefits exceed costs" as a decision rule.

Even though EPA never relies on a formal cost-benefit analysis or establishes rigid cost-benefit criteria for decisions, even though EPA always tilts its cost-benefit comparisons in the environment's favor, still Riverkeeper and the Northeast States argue that §316(b) forbids *any* comparison of costs to benefits. Riverkeeper 27-29.

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[5] *See, e.g.*, NWF 29 (arguing the rule would "result in a degree of protection no more stringent than can be proven to lead to a quantifiable benefit"); Ackerman 12 (regulators can use CBA to select the point of marginal equivalence between social costs and benefits).

3. Riverkeeper Concedes that §316(b) Provides Flexibility *Except* for Comparing Costs to Benefits

Riverkeeper's position conflicts with its own concession that the phrase "adverse environmental impact" gives EPA room to decide which impacts are adverse and when adverse impact has been minimized. For example, Riverkeeper concedes that §316(b) is flexible (ambiguous) enough to authorize EPA to:

- Consider energy efficiency and environmental impacts other than impingement and entrainment mortality (Riverkeeper 28-29);
- Conclude that some level of impact is *de minimis* or without meaningful environmental consequence and does not warrant further reduction (*id.* 29-30);
- Reject technologies for which costs are "wholly disproportionate" to "insubstantial" environmental "benefits" (*id.* 45);
- Consider site-specific factors, such as type of waterbody and size of the cooling water withdrawal relative to instream flow (*id.* 32-33).

Having conceded that the supposedly plain language of §316(b) allows all this discretion, Riverkeeper still argues that the same plain

language forbids using economic tools for measuring or comparing costs (including adverse environmental impacts) to benefits (including beneficial environmental impacts). But if EPA is allowed to consider these factors, courts consistently have said, it is up to the Agency to decide which tools to use to consider them. *See* Entergy 40-41; Entergy Reply §I.A.

In essence, Riverkeeper is saying that EPA may do everything in cost-benefit analysis *except* assign a dollar value to environmental costs and benefits and use it to facilitate an "apples-to-apples" comparison of all costs and benefits. For example, EPA apparently may not decide that some waterbodies need no entrainment reduction because the number of fish harmed is insignificant in broader ecological or economic terms and the cost of saving those fish is high. Similarly, EPA may not use an economic analysis to decide that the impact of increased air pollution "outweighs" the fish saved, even though that would mean EPA could not "minimize adverse environmental impact."

The fine distinctions Riverkeeper draws are, we submit, irrational. There is no textual basis for presuming that Congress intended them.

B. The Northeast States Erroneously Interpret "Minimize Adverse Environmental Impact" to Mean "Minimize Impingement Mortality and Entrainment"

The Northeast States at 15-16 assert that "minimize adverse environmental impact" is a hard-and-fast mandate to "promulgate a national rule that minimizes the killing and injuring of fish and other aquatic life" subject only to the limits of what is technologically achievable. Elsewhere, though, the Northeast States appear to concede that §316(b) does not have to focus on individual organisms. *See* NEStates 28-29 (§316(b) requires minimizing impact on "aquatic ecosystem").

Aside from this unresolved inconsistency, the problem with the Northeast States' argument is that it is little more than bare assertion. An attempt to tease out some overarching rationale, however, yields the following:

(1) Aquatic organisms may be harmed by impingement and entrainment (*id.* 3-4);

(2) The word "impact" can be defined as "the act of impinging or striking" and "a concentrated force producing change" (*id.* 20); therefore,

(3) Congress's use of "impact" demonstrates its "understanding of the nature of the environmental injuries associated with intake structures" (*id.*).

From the premise that Congress understood that intake structures cause impingement and entrainment, the Northeast States leap to several other unwarranted conclusions, namely that Congress intended to focus only on individual aquatic organism losses, as opposed to other environmental impacts; to classify every such loss to an intake structure, regardless of the nature of the organism,[6] as an "adverse environmental impact"; and to require power plants to reduce individual losses as much as technologically possible. This, the Northeast States contend at 31, is the "certain" impact that Congress intended to regulate without considering cost. But that is not what §316(b) says,

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[6] *Amici* NWF agree that the harm done by nonnative species is often substantial (NWF 20) but argue that invasive and harmful species nevertheless should be protected because of the "interconnectedness of life" (*id.* 5). But there is no evidence Congress intended to classify impacts to invasive or nuisance species as "adverse environmental impact." UWAG 10.

UWAG is not arguing that fish are not valuable just because they are not sought by commercial or recreational fishermen. Nor are we arguing that §316(b) is a regulatory tool for eradicating nuisance species. Still, it is a fact that state and federal wildlife managers routinely make decisions about what species are valuable and should be protected and what species are harmful. It makes no sense to require NPDES permit writers to save harmful fish when the wildlife agencies are tasked with suppressing them. Cost-benefit analysis can help avoid this, as EPA recognized when it authorized alternative standards based on site-specific cost-benefit comparisons. Response to Comments (Author Version) ("RTC") 315.

nor is there any basis for concluding it is what Congress meant.

Had Congress intended to "minimize impingement and entrainment" or even "minimize adverse impacts to aquatic organisms," it would have said so. Instead, Congress focused broadly on "minimizing adverse environmental impact" and gave EPA discretion to decide which environmental impacts to consider, which tools to use for evaluating them, and which technology best minimizes "adverse environmental impact" overall. UWAG 12. Exercising such discretion involves the sort of "risk assessment" in which the Northeast States at 30-31 agree cost-benefit analysis can play a role.

We are not suggesting that killing or injuring aquatic organisms is not "adverse" or cannot be regulated – only that reducing harm to all individual organisms as much as possible is not necessarily the measure of when "adverse environmental impact" is minimized. EPA chose to focus on reducing impingement mortality and entrainment, but it could have chosen other ways to measure "adverse environmental impact." Indeed, it could have decided to measure adverse environmental impact (for example) by the dollar value of damage to the aquatic ecosystem or other parts of the environment. By focusing on impingement mortality and entrainment, the Agency did not forfeit its right to use other measures of adverseness. UWAG 33.

C. Respondents and *Amici* Fail to Show That Cost-Benefit Comparisons Are Unnecessary or Impractical

1. Cost-benefit Comparisons Are Not Unnecessary

To bolster their interpretation, Riverkeeper and its supporters struggle to show how EPA can have the advantages of cost-benefit analysis without using it. Riverkeeper 28-33. A power plant need not spend millions of dollars to save a single organism, Riverkeeper says, because EPA could specify some "*de minimis* level" or limit harm to a prescribed number of fish. Riverkeeper 29-31. Also, EPA can set requirements for "less broad categories" or set different standards for different locations. *Id.* 32-33. Likewise, EPA need not impose a "one-size-fits-all rule," Riverkeeper says, because §316(b) authorizes requirements expressed as a range. And plants that impinge or entrain few fish (or none) will be able to meet the standards without expensive controls. *Id.* 30-31.

In suggesting that EPA could simply designate some *de minimis* level of organisms that each facility can affect, Riverkeeper ignores reality. As EPA has recognized repeatedly, the type, lifestage, and number of fish affected by a power plant are highly site-specific, as are the health and stability of their aquatic ecosystem. *See* UWAG 7. Unlike pollutant discharges, the number of organisms affected and the potential for "adverse environmental impact"

from such effects are not easy to predict by industry or facility type or even from withdrawal rate. UWAG 8-10. That is why EPA expressed the national performance standards as ranges of percentage reductions of impingement mortality and entrainment (regardless of amount). Pet.App. 234a. That is also why EPA authorized alternative standards based on cost-benefit balancing. Pet.App. 250a. Without them, even plants that impinge or entrain few organisms will not, as Riverkeeper claims at 30, be able to meet the standards without expensive controls.

Nor could EPA have avoided cost-benefit comparisons by expressing performance standards as ranges, distinguishing among different locations, or subcategorizing, as the Phase II rule's use of all three techniques demonstrates. UWAG 22, 23, 42. EPA had to set the performance standards as ranges to accommodate the uncertainties and variability in technologies. Pet.App. 228a. That it did so provided no relief for facilities that cause impacts less severe than those EPA anticipated. Similarly, EPA did not apply entrainment standards to facilities located on waterbody types that present less risk of entrainment. Pet.App. 227a, 229a-234a. But that in no way accounts for the variability in impacts from site-to-site for those facilities to which the standards *do* apply. And cost-benefit comparisons are important for subcategorization, as evidenced by EPA's decision to treat facilities with a low capacity utilization rate as a separate subcategory based both on its risk assessment and its judgment that

entrainment control for these facilities is not "economically practicable" (Pet.App. 233a).

Riverkeeper concedes at 28-29 that EPA may consider other environmental and energy trade-offs but never explains why EPA cannot use cost-benefit comparisons to do so. Riverkeeper's preferred technology – closed-cycle cooling – reduces the impact on individual fish but may or may not benefit the aquatic resource as a whole. *See, e.g.*, UWAG 9-10. Moreover, closed-cycle cooling increases environmental impacts like air pollution, habitat destruction, and noise and exacts an energy penalty. UWAG 10-11, 56; Entergy 49-51. As we have shown, cost-benefit comparison is an important tool for deciding which trade-offs are consistent with "minimizing adverse environmental impact." *Id.*

Riverkeeper and its supporters minimize the need for a cost-benefit mechanism to make rational decisions about the relative merits of these trade-offs, suggesting they are unlikely to be important or that they can be managed in other ways. For example, State *Amici* argue at 15-16 that EPA can protect Florida manatees, which depend on heated effluent for habitat, by granting a §316(a) variance from discharge limits for heat. But once a cooling tower is installed to reduce intake effects under §316(b), it will necessarily reduce heated effluent, to the manatees' detriment.

Likewise, State *Amici* at 16 think EPA does not need cost-benefit analysis to account for increased water consumption by cooling towers,

because closed-cycle cooling systems "withdraw far less water." Here, State *Amici* confuse "withdrawal" with "consumptive use." Once-through cooling "withdraws" more water but returns most of it to the waterbody; cooling towers evaporate more of the water they withdraw. UWAG 6. As Maryland's Department of Natural Resources noted in its comments on the Phase II rule, such "evaporative losses can have a significant impact, ... in rivers and lakes." RTC 3087.

Other *amici* argue cost-benefit analysis is unnecessary to account for adverse energy impacts of closed-cycle cooling, because such impacts are unlikely. For example, VoW at 19 claims that California already has determined once-through cooling systems "can be converted to alternative cooling technologies without major economic dislocation or disruption of the electricity transmission system." VoW's argument is both wrong and contradicted by a less parochial report recently issued by the Department of Energy ("DOE"). California has not made any final determination about close-cycle cooling's impacts; indeed, it is still awaiting an evaluation of how retrofitting affects reliability.[7] More important, DOE's examination of the energy impacts of

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[7] California Independent System Operator, *Mitigation of Reliance on Old Thermal Generation Including Those Using Once-Thru Cooling Systems Study Plan*, Final Draft Version 5.0 (January 2, 2008), http://www.caiso.com/1f52/1f529c671a380.pdf.

mandatory retrofitting concludes the adverse impacts to energy reliability nationally would be substantial. *See* DOE, "Electricity Reliability Impacts of a Mandatory Cooling Tower Rule for Existing Steam Generating Units" (Oct. 2008), http://www.oe.energy.gov/DocumentsandMedia/Cooling_Tower_Report.pdf.

VoW also argues at 16 that two repowering California plants show that retrofitting is feasible and painless. But they ignore the fact that repowering a steam electric plant means replacing all or most of the generating unit. It is costly, far from painless, and infeasible for many facilities that have years of useful life remaining or that, although needed when demand is high, do not operate enough to justify retrofitting.

2. Cost-benefit Comparisons Are Not Impractical

Besides arguing that cost-benefit comparisons are unnecessary, Riverkeeper and others argue that evaluating and quantifying the benefits of reducing impingement mortality and entrainment is too uncertain, complex, and burdensome a task for Congress to have authorized under §316(b). Riverkeeper 52; State *Amici* 17-18; CFoA 13-24. In support, they allege a variety of defects either in EPA's national cost-benefit assessment or in cost-benefit comparison methods in general. None of those arguments has merit.

For example, Riverkeeper at 52 and some of its supporters allege (incorrectly) that EPA's national

analysis assigned a value only to fish that could be caught and sold commercially and excluded forage species. In fact, EPA's analysis estimated the direct use value of all impingement and entrainment impacts, including impacts to recreational and forage species. Pet.App. 482a-485a. The Agency addressed forage species by using a "trophic-transfer model" based on the conservative assumption that all forage organisms are eaten by commercial and recreational predators. Pet.App. 483a.

EPA had less success assigning "non-use" values to organisms that would more likely reach age 1 by virtue of the rule or its alternatives but would never be caught recreationally or commercially. This difficulty was predictable, given the amount of site-specific information needed to make such estimates (which gauge the willingness of those who will never use the resource to pay for protecting or improving it). *See, e.g.*, Pet.App. 343a, 484a-485a. In any case, that EPA encountered such difficulties at the national level is not evidence that non-use values cannot be accounted for, quantitatively or qualitatively, at specific sites.

Riverkeeper at 34 and its *amici* also argue that understanding the ecological significance of impingement and entrainment is so complex and uncertain a task that Congress must have meant to prohibit it. In support, they cite EPA's rationale for deciding against a more "population-based" approach to national § 316(b) performance standards. *See, e.g.*, Ackerman 34-35; NWF 25-27. But EPA's decision to pursue a more administratively streamlined and

conservative approach at the national level is not evidence that making such assessments at the site-specific level is infeasible, nor have Respondents or their *amici* shown that it is.[8]

State *Amici* at 17-22 also argue that §316(b) should not be interpreted to allow site-specific balancing of costs and benefits because it would be administratively burdensome. But Congress has imposed more onerous "burdens" related to States' resource management responsibilities (like developing and implementing individualized water quality standards). And Congress specifically considered the burden of making case-by-case § 316(a) determinations and concluded they were not unmanageable. 1 *A Legislative History of the Water Pollution Control Act Amendments of 1972*, 93d Cong., 1st Sess. (hereinafter *Leg. Hist.*), 263 (1973). So it is hard to see why Congress would have thought this type of review too burdensome.

Also, State *Amici* overlook the fact that EPA anticipated the "burdensomeness" objection and addressed it in the rule. The Phase II Rule requires a permittee seeking an alternate standard both to

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[8] *Amici* CFoA at 19-21 oppose the site-specific cost-benefit provision because they say it allows permit writers to consider only the local benefits of achieving the national standards, thereby preventing full consideration of the impact on migratory or regional fish stocks. Its argument misreads the rule, which tells the permittee and regulator to consider all benefits (quantitative or qualitative, local or otherwise) of the facility's compliance with the national standards.

prepare a cost-benefit analysis that identifies significant sources of uncertainty *and* to convene, at the state's request, an independent peer-review panel to review the analysis. Pet.App. 579a.

II. The Structure and History of the Clean Water Act Do Not Support Respondents' Claims

Even though they argue that the consequence of §316(b)'s reference to §§301 and 306 is only procedural (NEStates 20; Riverkeeper 37 n.19), Respondents base much of their argument on §§301, 304, and 306 and their legislative history. Respondents contend that these technology-based requirements for pollutant discharges reveal Congress's intent to allow cost-benefit comparisons *only* when explicitly authorized. As Entergy showed in its initial brief at 38-42 and reply at §II.A, Respondents are wrong. Indeed, the evidence, including the documents written by Senate staff, indicates that Congress intended to give EPA discretion to weigh costs and benefits.

A. The Opinions of Congressional Staff Who Neither Vote on a Bill Nor Express their Views in a Forum Where Their Opponents Can Answer Them, Should Not Be Given Weight in Determining What Congress Meant by Statutory Language

Statutory construction starts with the words of the statute because majorities in both houses of

the legislature have agreed on those words and voted for them. Conference and committee reports have weight because they are agreed to by legislators who are most likely to have considered the drafts of the bills and be familiar with the arguments that produced the final language. Debates have some weight because they provide an opportunity to counter ambiguities and self-serving interpretations.

Documents written by Congressional staff have none of these indicia of reliability. Staff do not vote on bills. Staff do not participate in the recorded debates on bills. Staff may help write Committee and conference reports, but the value of those reports lies in the fact that they were adopted by the legislators. The views of staff that are not adopted by Senators or Representatives are not a guide to the legislators' opinions of the meaning of a bill and the reasons they voted for it. *See Rivera v. Commissioner*, Docket No. 41343-85, 89 T.C. 343, 349 (Tax Court 1987) (General Explanation of a statute "does not technically rise to the level of legislative history because it was authored by a congressional staff and not by Congress").

The notes and memoranda of Senate staff that Riverkeeper has produced from the National Archives are in this second category. These documents are not included in the compendium of legislative history that Senator Muskie requested be printed and which was to include "important explanatory materials." 1 *Leg. Hist.* III. As the Court has recognized, considering this sort of material is akin to "looking over a crowd and picking out your

friends," which invites "strategic manipulation" by "unelected staffers." *Exxon Mobil Corp. v. Allapattah Servs.*, 545 U.S. 546, 568 (2005).

Nevertheless, should this Court choose to examine those documents, it will find nothing to support Respondents' interpretation of the statute, as the analysis below shows.

B. Nothing in the Structure of §316 Supports Respondents' Interpretation

Accepting, for argument's sake, Respondents' theory that Congress rejected cost-benefit balancing under §§301 and 306, it does not follow that Congress felt the same way about §316(b). Section 316(b), as even the Second Circuit agreed (475 F.3d 83, 91), is different from other technology-based provisions in important ways. It regulates intakes, not discharges, under a standard that does not become more stringent with time and does not limit the factors EPA may consider and balance. All these distinctions weigh against making the simple-minded assumption that, by using the word "available" instead of "practicable," Congress intended to prohibit cost-benefit comparisons.

Nevertheless, Respondents argue that §316, read as a whole, reveals Congress's intent to split the difference between "technology-based" and "biologically based" requirements by subjecting intake structures to the first and thermal discharges to the second. NEStates at 41-42; Riverkeeper 13-14. As evidence, they cite how §316(b) differs from

§316(a), which provides a water quality-based variance from technology-based effluent limitations for heated water. But their finely wrought theory is not plausible.

Although there is agreement that §316(a) is a biologically-based variance, Congress did not, as the Northeast States claim, regulate thermal discharges based solely on biology and excluding costs and benefits. Rather, Congress authorized EPA first to establish *technology-based* controls for thermal discharges under §§301 and 306,[9] then provided a water quality-based variance to ensure that the cost of further controls, even where affordable, would not be imposed if not justified by the water quality benefits. Biology outweighs technology. This is a cost-benefit approach, as even Riverkeeper seems to concede. Riverkeeper at 49.

Nor does it follow that §316(b), simply by requiring EPA to consider technology, shows that Congress intended to prohibit considering the size or value of biological or other environmental impacts. To the contrary, §316(b) *requires* EPA to consider "environmental impact." Having imposed no technology-based requirements for intake structures in §§301 and 306, it is perfectly understandable that Congress combined evaluating technology with evaluating environmental impact in a single provision. No §316(a)-style variance was needed,

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[9] Clean Water Act §§301, 306, 33 U.S.C. §§1311, 1316. "Pollutant" is defined in 33 U.S.C. §3162(6) to include heat.

because consideration of environmental benefits is built into §316(b).

The main difference between Congress's approach to thermal discharges and its approach to intake structures was its choice of different biological criteria. For thermal discharges, Congress set a more specific biological criterion for deciding when costs are not justified by benefits. For intake structures it established a more open-ended criterion, which it trusted EPA to interpret.

C. Nothing in the Legislative History of §§301, 304, 306, or 316 Supports Respondents' Interpretation of the Act

Both Riverkeeper at 47 and the Northeast States at 38-39 say that §316(b)'s legislative history is not important in light of the "plain language" of the statute. Nevertheless, both make a considerable effort to show that the legislative history of the statute, particularly of §316, reveals Congress's intent to prohibit comparisons of costs and benefits under §316(b). Riverkeeper 33-41; NEStates 39-41. None of their arguments is persuasive.

1. The Legislative History is Largely Silent on the Factors EPA May Consider Under §316(b)

None of the sources Riverkeeper cites contains instructions about the factors Congress intended EPA to consider under §316(b) – a fact that

Riverkeeper ignores. As Entergy showed in its initial brief at 7, the only legislative statement with a substantive discussion of Congress's intent was by Representative Clausen, a Conferee. Mr. Clausen explained that Congress intended "best technology available" to mean "the best technology available commercially at an economically practicable cost." 1 *Leg. Hist.* 264.

Riverkeeper at 47 urges the Court to disregard this statement, arguing that it adds language to the statute. But it simply explains what "best available" means, using the word "practicable" (which the Northeast States agree at 21 is a synonym for "available").

2. The Legislative History Shows §316(b) Was an Afterthought

Discounting Representative Clausen's statement, Riverkeeper at 47 focuses on the history surrounding the "intense and protracted debate" on costs and benefits for *pollutant discharges.* From the results of that debate on discharge requirements, Riverkeeper concludes that Congress intended to preclude any comparison of costs and benefits for cooling water intake structures.

Riverkeeper reaches this conclusion despite the fact that §316(b) was hardly discussed, let alone "debated," by either House. That is because §316(b) was an afterthought, first appearing in the Conference Report. When the Senate considered the Conference Report, §316(b) was not even mentioned.

Senator Muskie's exhibit describing the Conference Report describes only §§316(a) and (c). 1 *Leg. Hist.* 175. On the House side, the only substantive discussion was the Clausen statement.

Riverkeeper disagrees that §316(b) was an afterthought, citing reports from the 1960s and early '70s that it claims show Congress's awareness of intake structures. Riverkeeper 5-6, 13-14 n.8. Congress may have known that intake structures have environmental impacts. But nothing in the documents Riverkeeper proffers suggests that Congress was concerned about the effect of intake structures on every aquatic organism of whatever type. Indeed, to the extent those documents bear on intake structures at all, they suggest that the commentors thought about the issue from a broader environmental and resource management standpoint. *See, e.g.*, EPA Office of Science and Technology, *Considerations Affecting Steam Power Plant Site Selection* 46 (Dec. 1968) (describing adverse effects of closed-cycle cooling and resource managers' consideration of intake effects).

Moreover, nothing in the legislative history suggests that, in adopting §316(b), Congress thought carefully about the level of control or the factors EPA could consider in setting the standards.

3. The Legislative Compromise on Technology-Based Regulation Does Not Support Riverkeeper's Interpretation

Riverkeeper argues that the resolution of the difference between the Senate and House over how technology-based effluent limitations should be set, especially for thermal discharges, shows that Congress intended to prohibit comparisons of costs and benefits under §316(b). But that is not what either the legislative history or Riverkeeper's collection of unpublished documents shows.

a. The Legislative History

Senate Bill 2770 focused on what technology could achieve and whether industry (as a whole, for best practicable technology (BPT), and at the plant level, for best available technology (BAT)) could afford it. 2 *Leg. Hist.* 1608-10, 1614-16. In neither case did it include a provision for considering energy or environmental impacts. For new sources, the Senate bill did not require EPA to consider either costs or energy and environmental impacts in setting new source performance standards (NSPS). However, it did authorize new sources to petition for relief from the standards when the economic and social costs of the standard bore no reasonable relationship to the social and economic benefits. *Id.* 1626.

House Bill 11896 provided for a full-scale, front-end analysis of costs and benefits for which the government would be responsible. 1 *Leg. Hist.* 981.

For BPT, H.R. 11896 required EPA to set effluent guidelines only after comparing costs to economic, social, and environmental benefits. *Id.* 980-81. For BAT, the bill required the National Academies of Sciences and Engineering to evaluate the technological feasibility, costs, and benefits of eliminating pollutant discharges. *Id.* 1042. It would have required EPA to develop BAT guidelines requiring elimination of pollutant discharges by 1981. But those limits would apply *only* if Congress, after reviewing the study, voted to make them applicable. *Id.* 1042-43. For thermal discharges, the House bill further required EPA to develop alternative limits for specific sites if a permittee demonstrated that the costs bore no reasonable relationship to the benefits. *Id.* 1044-45. For new sources, the House bill paralleled the Senate in all pertinent respects except one: the House bill required an up-front consideration by EPA of the costs and economic, social, and environmental impacts of achieving the standards. *Id.* 993.

With respect to thermal discharges, the Senate wanted all the technology-based provisions to apply. The House wanted to regulate thermal discharges separately by including a separate §316 in H.R. 11896. That provision would have required EPA, in adopting regulations for thermal discharges, to perform a cost-benefit analysis of the alternatives. 1 *Leg. Hist.* 348. It also would have provided relief from the limits where a discharger's costs bore no reasonable relationship to the social and economic benefits. *Id.*

The final legislation was a compromise, and the House gave more ground than the Senate. But the House got much of what it wanted. Most important, the House won with respect to *thermal discharges*.

All this history reveals is the Senate's aversion to requiring EPA, as a predicate to rulemaking, to demonstrate that the cost of the regulations would equal or exceed the benefits. It does not show a rooted aversion, by either chamber, to allowing EPA to make a cost-benefit comparison where the Agency thought it reasonable or necessary. Nothing in the documents Riverkeeper offers shows anything to the contrary.

b. Riverkeeper's Senate Staff Documents

Riverkeeper contends that the documents it has uncovered reveal that including the "technology-based" provision for intake structures was a pivotal development, breaking the logjam between the two chambers. Riverkeeper 13-14 n.8. But none of the documents says anything about why Congress included §316(b) or how the Conferees expected it to be implemented.

Riverkeeper wants the Court to conclude that the House and Senate intended §316(b) to prohibit EPA from comparing costs and benefits, because otherwise the Senate wouldn't have achieved what it wanted from the compromise. But the legislative record demonstrates only that the two sides compromised, each giving a little with respect to how

thermal discharges should be regulated. It reveals nothing, beyond the words of the statute, about what they expected of §316(b).

It is not credible to conclude, as Riverkeeper suggests, that the compromise approved variances to reduce costs of controlling discharges if fish populations were protected but required the same technology without regard to cost-benefit to control the intakes at the other end of the cooling system. It is beyond credulity to suppose that the House, having fought for and won a significant concession on cooling water discharges, would have agreed to a regulatory approach for intake structures that undid what it had accomplished.

Taken together, the language, context, and legislative history of §316(b) demonstrate that the statute is at least ambiguous as to whether EPA may compare costs and benefits in regulating cooling water intake structures. EPA's interpretation was reasonable and is entitled to deference.

III. For Over Thirty Years, EPA and the Courts Have Interpreted §316(b) to Allow Cost-Benefit Balancing

As shown in our initial brief at 37-41, for over 30 years EPA, the States, and the courts have recognized that §316(b) authorizes cost-benefit balancing. Riverkeeper's attempts (Riverkeeper 46) to marginalize or distinguish this longstanding interpretation are unavailing.

A. EPA Has Never Interpreted §316(b) to Prohibit Cost-Benefit Analysis

EPA has consistently said that a formal cost-benefit analysis, demonstrating that benefits at least equal costs, is not *required* to choose best technology available (or best available technology for pollutants). But it also has said, just as consistently, that some weighing of costs and benefits is *allowed*. That is all EPA did in the Phase II rule. *See supra*, section I.A.2.

Riverkeeper at 15 claims that EPA conceded in the preamble to the 1976 §316(b) rule (which was remanded by the Fourth Circuit in 1977) that it "had no discretion" to compare monetary costs with social benefits. Riverkeeper bases its argument on EPA's statement that "once such adverse effects have been identified ... the effort must be to select the most effective means of minimizing (*i.e.*, 'reducing to the smallest amount or degree') those adverse effects." 41 Fed. Reg. 17,387, 17,388 (April 26, 1976).

Contrary to Riverkeeper's claim, nothing in that statement indicates the Agency believed that §316(b) required EPA to select the technology that most effectively reduces impingement mortality and entrainment without regard to environmental impact or economic value. As pointed out in UWAG's brief at 38-39, EPA also recognized that "there are many factors that should be considered when determining whether an adverse environmental impact exists or is likely to exist," 41 Fed. Reg. 17,388. The Agency therefore concluded that, "rather than reliance on a

single factor," "all pertinent factors" (including the number of organisms affected and the level of any resulting damage to the aquatic ecosystem) "should receive adequate consideration." *Id.* Nowhere did EPA say that "adequate consideration" could not include the broader environmental or economic value of the organisms affected. Thus, EPA declined to require closed-cycle cooling, even for power plants in "biologically sensitive areas such as estuaries." *Id.*

Even if EPA's 1976 statement could plausibly be construed as acknowledging some limit on the Agency's authority to weigh costs and benefits, that has not been EPA's interpretation in practice over the past 30 years. Indeed, as explained in our initial brief at 15, EPA has since defined "minimize" in 40 C.F.R. §125.83 as "reduce to the smallest amount, extent, or degree *reasonably* possible." Determining what is "reasonably possible" encompasses some comparison of costs and benefits.

B. State and Federal Regulators Weigh Costs and Benefits Using the "Wholly Disproportionate" Test, Which the First Circuit Upheld in *Seacoast*

As our initial brief at 37-41 showed, regulators and courts have consistently interpreted §316(b) to authorize comparison of costs and benefits, showing that EPA's interpretation in the Phase II rule was reasonable. Riverkeeper's attempts to discount these interpretations are unpersuasive.

Riverkeeper begins by arguing at 45 n.22 that the First Circuit "did not uphold" the "wholly disproportionate" test. But the court affirmed the Administrator's decision that further minimizing entrainment would be wholly disproportionate to any environmental benefit. *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306, 311 (1st Cir. 1979). To uphold the Administrator's decision, the First Circuit *must* have decided that it was correct both as to law and as to the facts.

Riverkeeper also claims at 44-46 that the wholly disproportionate test is nothing more than a "cost-effectiveness" test in disguise. But deciding whether the costs of an alternative are "wholly disproportionate to any benefits" means examining whether the costs are bigger than the benefits, not whether the benefits are "essentially the same" while the costs are different.

Riverkeeper at 46 argues that the longstanding interpretation of §316(b) in many permit decisions is irrelevant, because those permit decisions are not EPA rules adopted with notice and comment procedures. This argument ignores the fact that permits too are subject to notice-and-comment procedures, as well as to EPA oversight. Even if that were not so, some states have adopted EPA-approved NPDES *regulations* for §316(b) that include cost-benefit balancing. For example, the State of Maryland's regulations implementing §316(b) expressly call for weighing costs against benefits. Dollar values are assigned to fish lost to impingement, and dischargers must mitigate the loss

if the additional cost over a five-year period does not exceed five times the estimated annual value of impingement loss. Maryland Environmental Regulations §26.08.03.05(D)(2).

Even states that have not adopted cost-benefit comparison in their §316(b) regulations have used it as a matter of practice. For example, a California court recently concluded that "[o]ver the years, a standard for economic considerations has emerged, commonly referred to as the wholly disproportionate test" (though review has been deferred pending Supreme Court review of the cost-benefit issue). *Voices of the Wetlands v. Cal. State Water Res. Control Bd.*, 69 Cal. Rptr. 3d 487, 543 (Cal. App. 6th Dist. 2007), *review granted, depublished by Voices of the Wetlands v. Cal. State Water Res. Control Bd.*, 74 Cal. Rptr. 3d 453, 180 P.3d 223 (Cal. 2008). And New York State has long incorporated the "wholly disproportionate" test into its own §316(b) law. *In the Matter of Entergy Nuclear Indian Point 2 & 3*, Interim Decision of the Assistant Commissioner, DEC No. 3-5522-00011/00004 (August 13, 2008).

Indeed, agencies of three of the Northeast States endorsed the "wholly disproportionate" test in commenting on the Phase II rule. "The former criterion ['costs wholly disproportionate to benefits'] has been applied to these Phase II and all other facilities since the 1970s and is supported by a substantial body of case law, permit decisions and legal opinions." New York State Dept. of Envtl. Conservation comments, at 4 (August 7, 2002). New Jersey likewise recommended using the "wholly

disproportionate" test. NJDEP comments, at 6 (Aug. 8, 2002); *see also* Massachusetts Office of Coastal Zone Management comments, 2 (June 14, 2002) (opposing EPA's change from "wholly disproportionate" to "substantially greater than"). Indeed, New Jersey has declined to require closed-cycle cooling at PSEG's Salem facility because "the estimated cost ... is wholly disproportionate." NJ Fact Sheet NJ0005622 (June 24, 1993), at 138-39.

In short, even the Phase II rule's most vociferous opponents have read §316(b) as authorizing at least *some* comparison of costs and benefits. Their endorsement is strong evidence that the "plain language" of §316(b) does not preclude cost-benefit balancing and that EPA's interpretation was reasonable.

CONCLUSION

For the reasons given above, UWAG urges the Court to affirm EPA's authority to compare costs and benefits both in setting national technology-based standards and for site-specific standards. For the reasons Entergy discusses in its reply at §III, a remand is unnecessary.

Respectfully submitted,

KRISTY A. N. BULLEIT
Counsel of Record
HUNTON & WILLIAMS LLP
1900 K STREET, N.W.
WASHINGTON, DC 20006-1109
(202) 955-1547

Counsel for Petitioner

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AMICUS CURIAE BRIEF

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In the Supreme Court of the United States

ENTERGY CORP.,
PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
AND
UTILITY WATER ACT GROUP,
PETITIONERS,

v.

RIVERKEEPER INC, ET AL.
RESPONDENTS.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF OF *AMICI CURIAE* THE AEI CENTER FOR REGULATORY AND MARKET STUDIES AND 33 INDIVIDUAL ECONOMISTS IN SUPPORT OF PETITIONERS

ROBERT E. LITAN
Counsel of Record
BROOKINGS INSTITUTION
1775 MASSACHUSETTS AVE, NW
WASHINGTON, DC 20036
202 797 6120

Full Names of Individual Amici Listed on Inside Cover

JULY 21, 2008

24

AMICI CURIAE

KENNETH ARROW, WILLIAM J. BAUMOL,
JAGDISH BHAGWATI, MICHAEL J. BOSKIN,
ROBERT CRANDALL, MAUREEN L. CROPPER,
MICHAEL GREENSTONE, ROBERT W. HAHN,
DAVID HARRISON, JR., R. GLENN HUBBARD,
ALFRED E. KAHN, LESTER B. LAVE, ROBERT LITAN,
PAUL MCAVOY, JAMES C. MILLER, III,
ALBERT L. NICHOLS, WILLIAM A. NISKANEN,
ROGER G. NOLL, WALLACE E. OATES, PETER PASSELL,
SAM PELTZMAN, PAUL R. PORTNEY, HARVEY S. ROSEN,
MILTON RUSSELL, THOMAS C. SCHELLING,
RICHARD SCHMALENSEE, CHARLES L. SCHULTZE,
V. KERRY SMITH, VERNON L. SMITH,
ROBERT N. STAVINS, KIP VISCUSI,
MURRAY WEIDENBAUM, LAWRENCE J. WHITE, AND
RICHARD ZECKHAUSER

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INTEREST OF *AMICI CURIAE*

This brief is being submitted on behalf of a group of economists.[1] The purpose of this brief is to provide information to the Court related to the appropriateness of using benefit-cost comparisons in the context of § 316(b) of the Clean Water Act, a section regulating the cooling water intake technology—in the interest of protecting fish and shellfish—of electricity generating units and certain other facilities that require large quantities of water to cool equipment for operational and safety reasons. We emphasize that the brief does not address the legal question of whether the U.S. Environmental Protection Agency ("EPA") has statutory authority to consider the benefits and costs of alternatives in setting requirements for facilities covered under §316(b). Nor does our brief discuss specifics of how benefit-cost comparisons should be used under that section or under the Clean Water Act more generally. Rather, we provide an overview of the extensive historical precedent for comparing benefits and costs in evaluating environmental regulations and the general principles regarding such comparisons that are widely accepted by economists.

As practicing economists and citizens, we have a substantial interest in seeing that EPA is allowed to compare benefits and costs to help it identify the

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[1] No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amicus curiae, its members, or its counsel made a monetary contribution to its preparation or submission. The parties have consented to the filing of *Amicus* briefs.

relevant tradeoffs and make sound decisions under §316(b). The societal resources at stake are substantial with regard both to §316(b) of the Clean Water Act and environmental, health and safety regulation more generally. Indeed, it is not uncommon for permitting decisions concerning individual plants under §316(b) to include fish-protection measures that may cost hundreds of millions of dollars. The economists who are signatories to this brief have identified general principles that we believe are appropriate in making decisions regarding fish protection under §316(b) and other environmental measures. We submit this brief in the interest of improving environmental decision-making.

BACKGROUND

A. Issue Presented to the Court

We understand that the issue before the Court is, in the words of the Government's brief responding to the petition for a writ of certiorari,

> Whether Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the Environmental Protection Agency (EPA) to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.[2]

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[2] Br. for Federal Resp'ts in Opp'n at (I)

We further understand that the issue is not whether EPA is required to base its decisions regarding "best technology available" (or "BTA") on a benefit-cost test, but only whether the Agency is allowed to weigh costs and benefits, among other factors, in deciding what controls must be installed to reduce fish and shellfish losses at the water intake structures of affected facilities.

We further understand that this issue is before the Court in part because of a difference among circuit courts, with the current Second Circuit decision in conflict with a prior First Circuit interpretation of the legality of comparing benefits and costs.[3]

As economists, we are not qualified to opine on how to interpret the statutory language of §316(b) or on how prior case law applies in this area. Rather, we respectfully offer our observations on the economic issues presented in this case in the hope that the comments will prove useful to the Court.

B. Comparisons of Benefits and Costs under Section 316(b) of the Clean Water Act

Our understanding is that for several decades, EPA (and the state agencies that have assumed permitting authority in some states) implemented §316(b) on a case-by-case basis that included weighing costs and benefits and declining to require technology "whose cost is wholly disproportionate to the environmental benefit to be gained," as affirmed

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[3] *Seacoast Anti-Pollution League* v. *Costle*, 597 F.2d 306 (1st Cir. 1979)

in a 1979 decision by the First Circuit.[4] We understand that under the terms of a consent decree requiring the issuance of regulations implementing §316(b) on a national basis, in 2004 EPA issued its "Phase II" rules (applying to about 550 existing power plants) that are at issue in this case. EPA's Phase II rules set national performance standards for BTA and also allowed facilities to request site-specific standards for BTA where they could provide information on costs and benefits and, if appropriate, demonstrate that the costs of meeting the national standards would be "significantly greater" than the benefits.[5] The technology selected by the permitting authority under the site-specific provision has to achieve an efficacy level that comes as close as practicable to the national performance standards without resulting in costs that are "significantly greater" than the benefits.

As we understand it, *Riverkeeper II* [6] found that EPA is prohibited from comparing costs and benefits in setting requirements under §316(b) or authorizing site-specific determinations. EPA may consider costs but only in determining whether a technology can be "reasonably borne" by the industry as a whole or in choosing among equally protective alternatives (what *Riverkeeper II* calls a "cost-effectiveness" analysis). EPA is *not* allowed under *Riverkeeper II* to consider costs in relation to benefits—to consider,

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[4] *Id.*,

[5] Office of Water, EPA, *Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule* (2004)

[6] *Riverkeeper, Inc.* v. *United States EPA*, 475 F.3d 83 (2d Cir. 2007)

for example, whether the costs of a slight improvement in fish protection are disproportionate to the benefits.

SUMMARY OF ARGUMENT

As economists, we believe that the Second Circuit's ruling, by not allowing the consideration of important information about the relationships between the benefits and costs of alternatives, is economically unsound. In particular, we believe that, as a general principle, regulators cannot make rational decisions unless they are allowed to compare costs and benefits and to use the results, along with other factors as appropriate, to choose among alternatives.

To the extent permissible under the statute and case law, EPA should be allowed to consider benefits and costs in establishing rules for implementing §316(b). We believe it would not be sensible to preclude the comparison of benefits and costs in setting §316(b) requirements. The potential costs of setting technology-based requirements for cooling water intakes can be very large, on the order of hundreds of millions of dollars for a single facility.

The Court's allowing EPA to consider benefits and costs would improve both the decision making process—by making it more transparent—and the regulatory decisions by allowing important relevant information to be considered explicitly.

ARGUMENT

A. Benefit-Cost Comparisons Are a Well-Established Tool to Foster Rational Decision Making

The general concept of comparing benefits and costs is familiar and long standing. Indeed, in 1772, Benjamin Franklin wrote in a letter about a method for making private decisions (which Franklin called "Moral or Prudential Algebra") that illustrates the basic features of benefit-cost assessments.[7] He recommended carefully listing pros (i.e., benefits) and cons (i.e., costs), estimating weights (i.e., valuing them in some common unit, such as dollars), and then determining their balance (calculating net benefits equal to benefits minus costs). Franklin's letter emphasizes the crucial importance of following a systematic process in complex situations in which there are a host of factors pointing one way or the other for a given decision. Specifically, Franklin writes:

> When those difficult cases occur, they are difficult chiefly because while we have them under Consideration, all the Reasons pro and con are not present to the Mind at the same time; but

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[7] "Letter to Joseph Priestly" in *Benjamin Franklin: Representative Selections, with Introduction, Bibliography and Notes*, Frank Luther Mott and Chester E. Jorgenson, eds., (New York: American Book Company, 1936 pp. 348-349), as cited in Boardman et al., Cost-Benefit Analysis: Concepts and Practice, Second Edition, (New Jersey: Prentice Hall, 2001, pp. 1-2).

> sometimes one Set present themselves, and at other times another, the first being out of sight. Hence the various Purposes or Inclinations that alternatively prevail, and the Uncertainty that perplexes us.[8]

The basic logic of Franklin's advice—that pros and cons should be described and compared to one another in making decisions—applies in the case of important environmental and other government regulatory decisions. Indeed, this basic logic and the increase in the importance of environmental, health and safety regulation over the past three decades has led all presidents since President Carter in 1978 to establish formal procedures requiring the preparation of benefit-cost assessments for various federal regulations.[9] President Carter issued Executive Order 12044 in 1978 to require federal agencies to conduct detailed regulatory analyses of certain proposed rules. President Reagan's 1981 Executive Order 12291 required agencies to evaluate the costs and benefits of all major future rules.[10] The first President Bush continued Executive Order 12291 when he took office in 1989.

In 1993, President Clinton issued Executive Order 12866, which also required that agencies compare the benefits and costs of major rulemakings and set guidelines for using the results of these assessments in regulatory decision making.[11] The

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[8] *Id.*

[9] 43 Fed. Reg. 12,661 (1978)

[10] 46 Fed. Reg. 13,193 (1981)

[11] 58 Fed. Reg. 51,735 (1993)

current President Bush continued Executive Order 12866 with relatively minor changes although in 2007 he issued Executive Order 13422 that required agencies to consider the need for and consequences of regulatory "guidance" (i.e., agency interpretation or policy on a regulatory issue that is generally non-binding).[12]

These executive orders have emphasized the importance of balancing costs and benefits and maximizing the net benefits (i.e., benefits minus costs) in setting regulations. Executive Order 12866 requires that agencies "propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs."[13]

The similarity in the language of these executive orders across decades indicates the bipartisan support for comparing benefits and costs in making regulatory decisions. President Reagan's Executive Order 12291 stated that,

> Regulatory action should not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society ... Regulatory objectives shall be chosen to maximize the net benefits to society.[14]

In a similar vein, President Clinton's Executive Order 12866 notes that,

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[12] 72 Fed. Reg. 2,763 (2007)

[13] 58 Fed. Reg. 51,736 (1993)

[14] 46 Fed. Reg. 13,193 (1981)

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating ... Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits . . . unless a statute requires another regulatory approach.[15]

All presidents since Jimmy Carter have emphasized the importance of weighing benefits and costs in making regulatory decisions concerning the environment and other areas. Indeed, a prominent legal scholar writing in 2000 concluded that the nation was nearing the end of a "first generation" debate about balancing benefits and costs through the development of benefit-cost "default principles".[16] In this context, he argued, the issue of whether benefit-cost analysis should be allowed to assist in sound decision making has been resolved, with "second generation" issues including details of how to implement the benefit-cost methodologies.

The practical assessment of benefits and costs has been furthered by detailed guidance on how it can be applied in environmental regulatory settings. EPA has provided important guidelines for assessing benefits and costs, first in 1983 and more recently in

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[15] 58 Fed. Reg. 51,735 (1993)

[16] Cass Sunstein. *Cost-Benefit Default Principles*, AEI-Brookings Joint Center for Regulatory Studies, Working Paper 00-7 (2000).

2000.[17] These guidelines provide detailed guidance on the key concepts involved in implementing such assessments. The EPA Guidelines were thoroughly reviewed by the Environmental Economics Advisory Committee of EPA's Science Advisory Board, comprised of thirteen well-recognized economists. The Office of Management and Budget has developed similar guidelines.[18]

In summary, carefully considering the social benefits and social costs of a given regulatory decision makes good sense, as presidents over the last three decades have recognized. Economists and other analysts have developed methods for making these assessments that fall under the general label of benefit-cost analysis. Benefit-cost assessments do not provide "answer machines" but rather provide a useful framework for evaluation of regulatory alternatives. As Franklin's early example makes clear, this framework is particularly important when the factors involved are complicated and numerous.

B. A Group of Economists Has Developed Consensus on the Use of Benefit-Cost Assessments for Environmental Regulation

There is a wide consensus among economists on various fundamental principles regarding the assessment of benefits and costs. In 1996, a group of distinguished economists assembled to develop principles for assessing benefits and costs in

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[17] EPA, *Guidelines for Preparing Economic Analyses* (2000).

[18] Office of Management and Budget. Circular A-4 to the Heads of Executive Agencies and Establishments. (Sept. 17 2003).

environmental, health and safety regulation. The resulting Statement of Principles was published jointly by the American Enterprise Institute, the Annapolis Center, and Resources for the Future.[19]

These same principles can inform what we believe to be the appropriate use of benefit-cost comparisons in making decisions under Section 316(b). The following is a summary of principles that we believe underlie the appropriate use of benefit-cost comparisons in making decisions under this section.[20]

Benefit-cost assessments provide a useful means of organizing a comparison of the favorable and unfavorable effects of proposed policies. Systematic comparisons of benefits and costs can help decision makers better understand the implications of various decisions. Such comparisons can provide useful estimates of the overall benefits and costs of

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[19] Kenneth J. Arrow, Maureen L. Cropper, George C. Eads, Robert W. Hahn, Lester B. Lave, Roger G. Noll, Paul R. Portney, Milton Russell, Richard Schmalensee, V. Kerry Smith, and Robert N. Stavins. *Benefit-Cost Analysis in Environmental, Health, and Safety Regulation: A Statement of Principles*. American Enterprise Institute, The Annapolis Center, and Resources for the Future (1996). A similar statement was published in Science magazine, Kenneth J. Arrow, Maureen L. Cropper, George C. Eads, Robert W. Hahn, Lester B. Lave, Roger G. Noll, Paul R. Portney, Milton Russell, Richard Schmalensee, V. Kerry Smith, and Robert N. Stavins. *Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?*. Science (Apr. 12, 1996). pp. 221-222.

[20] These principles also draw on similar ideas put forth in an *Amicus* brief filed with this court in 2000. Brief *Amici Curiae* for AEI-Brookings Joint Center for Regulatory Studies in *Whitman* v. *American Trucking Associations*, 531 U.S. 457 (2001).

proposed decisions. In many cases, these comparisons cannot be used to prove that the economic benefits of a particular decision will exceed or fall short of the costs because of uncertainties involved. But comparisons of benefits and costs can play an important role in informing the decision process even when the results are not conclusive.

Agencies should not be bound by a strict benefit-cost test, but should be allowed to consider available estimates of benefits and costs. There may be factors other than economic benefits and costs that agencies will want to weigh in decisions, such as equity within and across generations.

It is important to compare the benefits and costs of a proposed regulatory requirement not only to the status quo but also to alternative regulatory approaches and levels of stringency that could be adopted. Systematic review of benefits and costs can often identify opportunities to modify proposed requirements in ways that increase benefits at relatively low cost or reduce costs substantially with little loss in benefits.

The scale of the benefit-cost assessment should be related to the importance of the decision. The scale of the assessment should depend on both the stakes involved and the likelihood that the resulting information will affect the ultimate decision.

Not all impacts of a decision can be quantified or expressed in dollar terms. Care should be taken to ensure that quantitative factors do not dominate qualitative factors in decision making. A common critique of benefit-cost comparisons is that they do not emphasize factors that are not easily quantified

or monetized. That critique has merit. There are two principal ways to address it: first, quantify as many factors as reasonable and quantify or characterize the relevant uncertainties; and second, give due consideration to factors that defy quantification but are thought to be important.

CONCLUSION

We believe that this case provides the Court with an important opportunity to provide for sound decision making in environmental matters. Systematic comparisons of benefits and costs have been important elements of government decision making in environmental matters—including §316(b) of the Clean Water Act—for many decades. We believe that decisions on environmental matters should be based upon a full assessment of benefits and costs, taking into account elements that cannot be quantified as well as uncertainties regarding various costs and benefits. This information will permit the appropriate balancing of benefits and costs in key environmental decisions.

Respectfully Submitted,

Robert E. Litan
Counsel of Record
Brookings Institution
1775 Massachusetts Ave, NW
Wash, DC 20036
202 797 6120

LIST OF *AMICI CURIAE*

Kenneth Arrow
Professor of Economics Emeritus, Stanford University

William J. Baumol
Professor of Economics Emeritus, Princeton University
Academic Director, Berkley Center for Entrepreneurial Studies, New York University

Jagdish Bhagwati
University Professor, Economics and Law, Columbia University

Michael J. Boskin
T.M. Friedman Professor of Economics and Hoover Institution Senior Fellow, Stanford University
Former Chairman, President's Council of Economic Advisers

Robert Crandall
Senior Fellow, Brookings Institution

Maureen L. Cropper
Professor of Economics, University of Maryland

Michael Greenstone
3M Professor of Environmental Economics, Massachusetts Institute of Technology
Nonresident Senior Fellow, Brookings Institution

Robert W. Hahn
Executive Director, Center for Regulatory and Market Studies and Senior Fellow, AEI

David Harrison, Jr.
Senior Vice President, National Economic Research Associates
Former Senior Staff, President's Council of Economic Advisers

R. Glenn Hubbard
Dean and Russell L. Carson Professor of Finance and Economics, Graduate School of Business, Columbia University
Former Chairman, President's Council of Economic Advisers

Alfred E. Kahn
Robert Julius Thorne Professor of Political Economy Emeritus, Cornell University
Former Chairman, Civil Aeronautics Board

Lester B. Lave
University Professor and Higgins Professor of Economics, Carnegie Mellon University
Former Member, EPA Advisory Council on Clean Air Compliance Analysis

Robert Litan
Senior Fellow, Brookings Institution

Paul McAvoy
Wiliams Brothers Professor of Management Studies Emeritus, Yale School of Management, Yale University
Former Member, President's Council of Economic Advisers

James C. Miller, III
Former Director, Office of Management and Budget
First Administrator, Office of Information and Regulatory Affairs

Albert L. Nichols
Vice President, National Economic Research Associates
Former Director, Economic Analysis Division, EPA

William A. Niskanen
Chairman, Cato Institute
Former Member, President's Council of Economic Advisers

Roger G. Noll
Professor of Economics Emeritus, Stanford University

Wallace E. Oates
Professor of Economics, University of Maryland
University Fellow, Resources for the Future

Peter Passell
Senior Fellow, Milken Institute

Sam Peltzman
Ralph and Dorothy Keller Distinguished Service Professor Emeritus of Economics, Graduate School of Business, University of Chicago

Paul R. Portney
Dean, Eller College of Management, University of Arizona
Former Chief Economist, President's Council on Environmental Quality

Harvey S. Rosen
John L. Weinberg Professor of Economics and Business Policy, Princeton University
Former Chairman, President's Council of Economic Advisers

Milton Russell
Senior Fellow, Institute for a Secure and Sustainable Environment
Professor Emeritus, Department of Economics, University of Tennessee, Knoxville

Thomas C. Schelling
Distinguished University Professor Emeritus, University of Maryland
Nobel Laureate in Economics

Richard Schmalensee
Howard W. Johnson Professor of Management and Economics, Massachusetts Institute of Technology
Former Member, President's Council of Economic Advisers

Charles L. Schultze
Senior Fellow Emeritus, Brookings Institution
Former Chairman, President's Council of Economic Advisers

V. Kerry Smith
W.P. Carey Professor of Economics, W.P. Carey School of Business, Arizona State University

Vernon L. Smith
Professor of Economics and Law, Chapman University
Nobel Laureate in Economics

Robert N. Stavins
Albert Pratt Professor of Business and Government, John F. Kennedy School of Government, Harvard University
Former Chairman, EPA Environmental Economics Advisory Committee

Kip Viscusi
University Distinguished Professor of Law, Economics and Management, Vanderbilt University

Murray Weidenbaum
Edward Mallinckrodt Distinguished University Professor, Washington University, St. Louis
Former Chairman, President's Council of Economic Advisers

Lawrence J. White
Professor of Economics, Stern School of Business, New York University

Richard Zeckhauser
Frank P. Ramsey Professor of Political Economy, John F. Kennedy School of Government, Harvard University

AMICUS CURIAE BRIEF

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Supreme Court of the United States

ENTERGY CORPORATION,

Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

PSEG FOSSIL LLC, *et al.*,

Petitioners,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

UTILITY WATER GROUP,

Petitioner,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF OF *AMICI CURIAE* AMERICAN CHEMISTRY COUNCIL, AMERICAN FOREST & PAPER ASSOCIATION, AMERICAN IRON AND STEEL INSTITUTE, CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA, AND NATIONAL ASSOCIATION OF MANUFACTURERS IN SUPPORT OF PETITIONERS

RUSSELL S. FRYE
Counsel of Record
FRYELAW PLLC
1101 30th Street, N.W. Suite 220
Washington, DC 20007-3769
(202) 572-8267

Counsel for Amici Curiae

(Additional Counsel Listed on Signature Page)

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INTEREST OF *AMICI CURIAE*[1]

Amici curiae American Chemistry Council, American Forest & Paper Association, American Iron and Steel Institute, Chamber of Commerce of the United States of America, and National Association of Manufacturers are trade associations and business organizations that represent the interests of business and industry in the reasonable implementation of requirements for cooling water intake structures under Clean Water Act section 316(b), 33 U.S.C. § 1326(b).

These organizations represent a broad spectrum of U.S. business and industry. Their members include companies that withdraw water from rivers, lakes, estuaries, and the territorial seas for use in their facilities for cooling purposes. These members may be affected directly by the Second Circuit's incorrect interpretation in the decision below of the requirements of Clean Water Act section 316(b). *Amici* also represent businesses that are large consumers of electric power, which can expect increased operating costs if less-flexible, more-expensive requirements under section 316(b) mandated by the decision below are imposed on electric utilities from which those businesses purchase their electric power. Also, to the extent that the Second Circuit's view of the permissible consideration of costs

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[1] The parties have consented to the filing of this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. The only person other than these *amici curiae* or their members that made a monetary contribution to its preparation or submission is the American Petroleum Institute.

and benefits in setting effluent limitations under the Clean Water Act is followed by EPA or individual permit writers in imposing effluent limitations on point-source discharges of wastewater, *amici*'s members will suffer additional adverse effects as a result of the decision below.

For the most part, *amici*'s members do not operate facilities subject to the Environmental Protection Agency's ("EPA's") regulation establishing requirements for cooling water intake structures at Phase II existing facilities, 69 Fed. Reg. 41,575 (July 9, 2004) (Pet. App. 122a-593a)[2] (hereinafter the "Phase II Rule"), which is the subject of the decision below. That is because the Phase II Rule regulates only existing facilities whose primary activity is the generation and transmission or sale of electricity. *See* 40 C.F.R. §§ 125.90, 125.91(a) (2007). But existing industrial and commercial facilities (as well as smaller electricity generation plants) that have cooling water intake structures, which EPA has designated "Phase III facilities," are also subject to requirements implementing Clean Water Act ("CWA") section 316(b), established by permit writers on a case-by-case, "best professional judgment," basis. 40 C.F.R. § 125.90(b) (2007); 71 Fed. Reg. 35,006, 35,008 (June 16, 2006). Thus, *amici*'s members will be adversely affected if those permit writers follow the Second Circuit's restrictive view of the permissible consideration of costs and benefits in establishing requirements under CWA section 316(b).

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[2] Citations to the Pet. App. refer to the appendix filed with the petition for writ of *certiorari* in No. 07-588.

SUMMARY OF ARGUMENT

The Second Circuit erroneously concluded that EPA effectively is precluded from considering the relationship of costs to benefits when establishing requirements for cooling water intake structures under Clean Water Act section 316(b). This conclusion, which is at odds with long-standing EPA practice and decisions of other courts, would produce serious adverse impacts for many more facilities than just large electric generating plants. The Second Circuit's interpretation of section 316(b) will no doubt be considered, and perhaps followed, in applying section 316(b) to a large universe of industrial and commercial facilities that withdraw water for cooling purposes. Moreover, because the wide diversity among those industrial and commercial facilities makes flexibility in applying section 316(b) even more important to avoid imposing excessively costly requirements for little benefit, the extreme, rigid view of section 316(b) in the Second Circuit's decision has the potential to have a proportionately more severe effect on those facilities than on the electric utilities represented by petitioners.

Additionally, since the Second Circuit based its restrictive view of EPA's discretion in establishing requirements for cooling water intake structures under CWA section 316(b) on its interpretation of CWA section 301 and section 304 requirements for limitations on wastewater discharges, 33 U.S.C. §§ 1311 and 1314, the adverse effects of the decision below may be felt much more broadly than by just those facilities that operate cooling water intake structures. The Second Circuit's view that EPA cannot reject a wastewater treatment technology option that has far greater costs but only

minimal additional pollution reduction benefits would, if applied to the thousands of facilities with wastewater discharges, impose serious financial burdens on society for little benefit.

These unproductive, rigid technology-selection requirements the Second Circuit found in the Clean Water Act are a product of improper statutory interpretation. The Second Circuit failed to give deference to EPA's long-standing interpretation of CWA section 316(b). It based its own interpretation on a selective analysis of provisions of the Clean Water Act addressing effluent limitations for wastewater discharges under CWA sections 301 and 304, an analysis that also ignored essential differences in wording and purpose between those sections and CWA section 316(b).

Moreover, the Second Circuit relied on an unduly restrictive view even of those portions of CWA sections 301 and 304 that it did focus on. Its conclusion that EPA lacks discretion to give almost any consideration to the reasonableness of the relationship between the cost of wastewater control technology options and the pollution reduction benefits those options produce is contrary to the plain language of CWA sections 301 and 304 and to virtually every other appellate decision interpreting those sections.

ARGUMENT

I. The Second Circuit's Interpretation of Section 316(b) Could Impose Costly, Unnecessary Requirements on Cooling Water Intake Structures at Many More Facilities than Just Electric Utilities.

The Phase II Rule that is the subject of the decision below affects hundreds of electric utility generating plants. If EPA is forced by the decision below to impose requirements based on the most effective technology for cooling water intake structures that the utility sector can financially bear, that could impose billions of dollars of compliance costs on the utility sector. *See* 69 Fed. Reg. at 41,605 (Pet. App. 255a-257a). Much of those costs can be expected to be passed on to purchasers of electricity, such as those represented by the *amici*. *Amici* would also be adversely affected by the power plant downtime and loss of generating capacity predicted to occur. *See* 69 Fed. Reg. at 41,605 (Pet. App. 257a-259a).

The impact of the Second Circuit's decision may be even wider, however, because of its potential effect on the implementation of CWA section 316(b) at the Phase III industrial and commercial facilities and small utilities. Under 40 C.F.R. § 125.90(b) (2007), Phase III facilities and other facilities for which EPA has not promulgated nationwide categorical standards "must meet requirements under section 316(b) of the CWA determined by the [state or EPA permit writer] on a

case-by-case, best professional judgment (BPJ) basis."[3] *See also* 71 Fed. Reg. at 35,008.

In the decision below, the Second Circuit has interpreted CWA section 316(b) as dictating that, at least when developing national standards for a category of sources, EPA must choose the most effective technology for minimizing the impact of cooling water intake structures that the category as a whole "can reasonably bear." *Riverkeeper, Inc. v. U.S. EPA*, 475 F.3d 83, 99-100 (2nd Cir. 2007) (Pet. App. 26a-27a). EPA may not consider whether the costs of that technology significantly outweigh the benefits, even if the costs are wholly disproportionate to the benefits, but may only consider relative costs when two technologies "produce essentially the same benefits." Pet. App. 28a. In fact, the decision suggests that, faced with a technology that costs 50 percent more but assures that one additional fish will be saved from impingement on or entrainment in the cooling water intake structure, EPA may be obligated to impose requirements based on the more costly technology. *Id.* at 26a-28a (EPA could not reject, "on cost considerations," a technology that "saves" at least 102 fish if electric utilities could afford it, even if it is 50 percent more expensive than a technology "saving" 99-101 fish).

Although the decision below was in the context of national, categorical requirements for Phase II facilities and does not apply directly to case-by-case, "best

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[3] While other portions of the Phase II Rule have been suspended by EPA, that section remains in effect. 72 Fed. Reg. 37,107, 37,108 (July 9, 2007).

professional judgment" permit requirements for intake structures at the remaining universe of existing facilities (Phase III facilities), permit writers now must decide, in considering whether to impose additional requirements for cooling water intake structures at individual Phase III facilities, whether to adopt the flexible interpretation of section 316(b)'s requirements followed by EPA and other courts, or the extreme view of the limits of EPA's discretion under CWA section 316(b) provided by the Second Circuit in the decision below.

If the permit writers choose to follow the Second Circuit's view that "best technology available for minimizing environmental impact" means the technology that produces the least impingement and entrainment of aquatic organisms, no matter how high the cost in comparison to the incremental reduction of impingement and entrainment, then the many Phase III facilities represented by *amici* and others will be adversely affected, and society will suffer large costs with little incremental benefit.

This is not just a theoretical concern. In looking at the large electric generating plants that were the subject of the Phase II Rule, EPA identified a suite of technologies that, when used in the best configuration for local conditions, are capable of controlling impingement and entrainment at cooling water intake structures to an extent *approaching that of closed-cycle cooling* (the available technology EPA found to have the best performance in reducing entrainment and impingement mortality), but *at one-ninth the cost.* 69 Fed. Reg. at 41,605-606, 41,650 (Pet. App. 255a-257a,

260a-261a, 450a-4452a). The Second Circuit apparently would have EPA issue regulations requiring electric utilities to install controls with performance *identical* to closed-cycle cooling, which would impose billions of dollars of additional costs on electric utilities, for only a small increment of impingement and entrainment reduction.

Although Phase III facilities collectively only withdraw about 10 percent as much cooling water as the large electric utility plants covered by Phase II, 71 Fed. Reg. at 35,017, there are thousands of industrial, commercial, and institutional facilities that use cooling water. *See* 69 Fed. Reg. 68,444, 68,455 n.4 (Nov. 24, 2004) (almost 700 Phase III facilities have intake structures withdrawing 2 million gallons or more per day). If only large Phase III facilities (those withdrawing over 50 million gallons a day for cooling, of which there are about 150) were subject to regulations imposing stringent requirements for cooling water intake structures similar to those the Phase II Rule imposed on large electric utilities, EPA estimates that compliance costs would be on the order of $40 million per year. 71 Fed. Reg. at 35,031-32. Because of the nature of Phase III facilities, EPA estimates that such expenditures would produce only about one-fourth of the benefit per dollar spent as the Phase II Rule.[4]

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[4] *Id.* at 35,018. Existing industrial facilities present a wider range of locational and process constraints for application of uniform technology requirements than do existing utility generating stations. *Cf.* 69 Fed. Reg. at 41,605-606, 41,608 (Pet. App. 256a-259a, 270a-271a). Industrial facilities are more likely to be located in close proximity to other properties, and it

(Cont'd)

Industrial facilities regulated under Phase III on average withdraw far less cooling water than the large utilities covered by Phase II. Even on a flow-weighted basis, however, EPA estimated that the number of organisms impinged and entrained by Phase III facilities is approximately one third the number of organisms impinged and entrained by Phase II facilities withdrawing the same volume. 69 Fed. Reg. at 68,463 col. 3. This reflects in part the fact that the smaller Phase III facilities are less likely to withdraw a significant portion of the source water body, and a smaller percentage of the overall cooling water flow withdrawn by Phase III facilities comes from more-sensitive tidal river, estuary, and ocean environments than for Phase II facilities. *See id.* col. 1. If, as the Second Circuit concluded, section 316(b) requires even more stringent provisions than those imposed by the Phase II Rule on electric utilities, then applying that same approach to the remainder of existing facilities (Phase III facilities) would impose even more-disproportionate costs with even lower cost-effectiveness.

The Second Circuit decision at issue here will, at a minimum, create uncertainty and confusion about what factors may be considered by permit writers in the

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(Cont'd)

is not unusual for them to have been operated and expanded over half a century or more. Installation of certain technologies to reduce impingement and entrainment mortality may be physically impossible due to site constraints. In addition, the generally smaller scale of cooling water usage at industrial facilities (*compare* 67 Fed. Reg. 17,121, 17,130, 17,135 (April 9, 2002) *with* 69 Fed. Reg. at 68,455-56 and 68,502) can make some technologies impracticably costly and cost-ineffective.

application of section 316(b) on a case-by-case basis to the many facilities with cooling water intake structures outside of the electric utility sector. Additionally, if permit writers choose or are required to use the Second Circuit's very restrictive view of section 316(b), the Second Circuit's decision will impose a large financial burden on society for measures at these additional facilities that are not cost-effective and may have incremental costs far greater than their benefits.[5]

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[5] A group of environmental advocacy groups with essentially the same members as respondents in the instant case are pursuing litigation, currently stayed, seeking to overturn EPA's decision to continue to regulate Phase III existing facilities on a case-by-case basis. *ConocoPhillips, et al. v. EPA*, Fifth Cir. No. 06-60662; *Riverkeeper, et al. v. EPA*, S. D. N.Y. No. 1:06-cv-12987-PKC. If that litigation was successful, then the impact of the Second Circuit's decision—which requires that nationwide categorical section 316(b) requirements be based on "the optimally best performing" facilities in the country, Pet. App. 26a, rather than on technologies that can be applied to an individual facility—could be even greater. In the Phase III rulemaking, EPA has already found that imposing a uniform categorical set of requirements for all Phase III existing facilities would, given the highly diverse nature of such facilities and their setting, impose costs on the sector wholly disproportionate to the benefits. 71 Fed. Reg. at 35,017-18.

II. The Second Circuit's Rejection of Cost and Benefit Considerations for Implementing Section 316(b) Is Not Compelled by the Statute.

A. The Second Circuit Improperly Ignored the Statutory Language and EPA's Reasonable Interpretation of It.

The rigid, restrictive view of CWA section 316(b) offered by the Second Circuit, with its great potential for imposition of costly and unnecessary regulatory burdens, is not compelled by the only reasonable interpretation of the statute. To the contrary, the Second Circuit rejected EPA's permissible interpretation and substituted its own reading of the statute: an arbitrary reading that ignores critical provisions of the statutory language.

As petitioners have explained in their briefs, the Second Circuit's conclusion that EPA is so constrained in implementing CWA section 316(b) is contrary to EPA's consistent interpretation of the statute since the 1970s and is contrary to the interpretation adopted by other courts. *See, e.g.*, merits brief for the Federal Parties at 27-28. The opinion below acknowledged that "section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that the EPA must consider in determining BTA." Pet. App. 20a. Since section 316(b) says nothing specific about the weight that EPA should accord costs and benefits in determining the "best technology available for minimizing adverse environmental impact," the Second Circuit should have deferred to EPA's long-standing, reasonable

interpretation of section 316(b). *See, e.g., Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-45 (1984); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 132-33 (2000); *Thomas Jefferson Univ. v. Shalala*, 512 U.S. 504, 512 (1994); *Bankamerica Corp. v. United States*, 462 U.S. 122, 130-32 (1983). But instead of determining whether EPA's interpretation is a permissible one, the Second Circuit unabashedly substituted its own view of how the statutory language is "more properly understood." Pet. App. 28a.

Beyond that lack of deference to EPA's interpretation, though, the Second Circuit's interpretation simply fails to reflect the language of the Clean Water Act. First, the Second Circuit effectively gives no consideration to what Congress intended by the terms "minimize" and "adverse environmental impact" in section 316(b). In the Second Circuit's view, a technology that "saves" 102 fish minimizes adverse environmental impacts, while one that "saves" 101 fish does not—without consideration of whether the cooling water intake structure as-is causes adverse environmental impact, or whether one less fish impinged on or entrained through the cooling water intake structure will have any impact at all on the environment, i.e., the health of the aquatic community in the source water body. *See* p. 6, *supra*.

In the absence of any reason to the contrary, words in statutes should be given their ordinary, dictionary meaning. *See, e.g., MCI Telecomms. Corp. v. AT&T*, 512 U.S. 218, 225-28 (1994). In common usage "minimize" does not mean "eliminate," but rather incorporates the

notion of reducing to the extent practicable. *See* American Heritage Dictionary of the English Language, Fourth Ed. (2000), usage note for "minimal." "Adverse" means "harmful or unfavorable." *Id.* The Second Circuit's view of what is required by section 316(b)—elimination of any impact if affordable technology is available to do so—is inconsistent with the ordinary meanings of those terms. Moreover, it effectively reads "adverse" out of the statute, violating the basic principle of statutory interpretation that statutory language should not be interpreted so that one or more of the words Congress used become "mere surplusage." *See, e.g., TRW Inc. v. Andrews*, 534 U.S. 19, 31 (2001).

Looking beyond the language of section 316(b) itself (or, more accurately, overlooking it), the Second Circuit concluded that section 316(b)'s reference to point sources subject to standards issued under CWA section 301 necessarily incorporated into section 316(b) the criteria EPA must apply in developing effluent limitations guidelines for point source discharges under Clean Water Act sections 301 and 304. *See* Pet. App. 20a, 23a. Moreover, as explained below, the Second Circuit, without explanation, decided that the relevant criteria to be incorporated into section 316(b) are those that applied post-1984 to discharges of toxic pollutants.[6]

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[6] Case law discussing the Best Available Technology level of control for wastewater discharges sometimes refers to "the 1983 standards," "the 1984 standards," or "the 1987 standards." The Federal Water Pollution Control Act of 1972 originally required compliance with limitations based on the Best Available Technology by July 1, 1983. The Clean Water Act of (Cont'd)

Even then, the Second Circuit's extrapolation of requirements for intake structures relied on its incorrect assertion that EPA has virtually no discretion to consider the relationship between costs and benefits when setting Best Available Technology ("BAT") effluent limitations for toxic pollutants.

B. Imposing the Factors for Establishing Effluent Limitations on the Cooling Water Intake Section of the CWA Is Unjustified.

The Second Circuit's conclusion that section 316(b) incorporates criteria for decision-making identical to those for effluent guidelines under sections 301 and 304 cannot be squared with the facts that: (1) section 316(b) does not say anything about incorporating the criteria used to set effluent limitations, (2) section 316(b) contains distinctly different language from sections 301 and 304, and (3) the two sets of provisions have different goals. The technology-based effluent limitations in sections 301 and 304 (and section 306, for new sources) were Congress' response to difficulties that had been experienced in trying to limit wastewater discharges based solely on predictions of what was necessary to assure a healthy population of aquatic life in the receiving waters. *See EPA v. California, ex rel. State Water Res. Control Bd.*, 426 U.S. 200, 203-205

(Cont'd)

1977 changed that deadline to July 1, 1984 for most industry categories, with compliance at the latest required by July 1, 1987. *See EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 70 n.9 (1980). (It also substituted Best Conventional Technology for Best Available Technology for "conventional" pollutants. *Id.*)

(1976). Congress chose, as one of the centerpieces of the new legislation adopted in 1972, an approach that set effluent limitations based initially solely on the capability of available wastewater treatment technology, without regard to whether that level of treatment was necessary to meet water quality standards in the receiving waters. *Id.*; *see also* S. Comm. on Env't & Pub. Works, 99th Cong., 2nd Sess., Report 99-1004 to Accompany S. 1128 (1985 Clean Water Act Amendments) (Comm. Print 1985) 3-4. In contrast, the language of Section 316(b) directs EPA to establish requirements for cooling water intake structures that will "minimize adverse environmental impact." Congress deliberately took a different approach in section 316(b) than the approach it adopted for effluent limitations in sections 301 and 304, where the wastewater treatment technology requirements were disconnected from any finding of adverse environmental impact.[7] *See, e.g., E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 129-30 (1977); *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1044 (3rd Cir. 1975), *modified in part on other grounds*, 560 F.2d 589 (3rd Cir. 1977), *cert. denied*, 435 U.S. 914 (1978) (guidelines to be uniform rather than varying with location and nature of receiving water).

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[7] In addition to not specifying the factors to be considered in imposing conditions on intake structures, section 316(b) differs as well from CWA provisions that are aimed at controlling wastewater discharges in that it does not contain deadlines for implementation or compliance and does not direct EPA to develop guidelines for implementation with respect to categories of sources. *Cf.* CWA §§ 301(b) and 304(b), 33 U.S.C. §§ 1311(b) and 1314(b).

Moreover, the Clean Water Act requirements for technology-based effluent limitations were expressly intended to move dischargers on a path towards a goal of eliminating pollutant discharges (not just eliminating adverse environmental impacts), and the case law interpreting effluent limitations guidelines that the Second Circuit relied upon is explicitly based in part on the courts' consideration of what interpretation would be consistent with this ultimate goal of eliminating discharges.[8] *See* CWA §§ 101(a)(1) and 301(b)(2)(A), 33 U.S.C. §§ 1251(a)(1) and 1311(b)(2)(A); *Nat'l Crushed Stone*, 449 U.S. at 69-70, 74 (1980); *Natural Res. Def. Council, Inc. v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) (viewing technology-based limitations "[i]n the context of a statute which seeks the elimination of pollution"); *Chem. Mfrs. Ass'n v EPA*, 870 F.2d 177, 250 (5th Cir. 1989), *cert. denied sub nom. PPG Industries, Inc. v. EPA*, 495 U.S. 910 (1990). *See also, e.g., Am. Iron & Steel*, 526 F.2d at 1051-52; *Nat'l Ass'n of Metal Finishers v. EPA*, 719 F.2d 624, 664 (3rd Cir. 1983), *rev'd on other grounds sub nom. Chem. Mfrs. Ass'n v. Natural Res. Def. Council, Inc.*, 470 U.S. 116 (1985). Nowhere in the CWA is there a similar series of increasingly stringent steps leading towards elimination of cooling water intake structures or their effects.

The Second Circuit decision simply ignored these critical distinctions between section 316(b) and sections

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[8] The zero discharge goal was intended as "a policy objective. It is not locked in concrete. It is not enforceable." 117 Cong. Rec. 38800 (1971) (remarks of Sen. Muskie), reprinted in 2 A Legis. Hist. of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Sess., Senate Comm. on Public Works Serial No. 93-1 (Jan. 1973) ("Legis. Hist.") 1262.

301 and 304. Then the Second Circuit compounded the error by focusing solely on requirements for BAT effluent limitations addressing toxic pollutants (sections 301(b)(2)(A) and 304(b)(2)(B), 33 U.S.C. §§ 1311(b)(2)(A) and 1314(b)(2)(B)), as explained in the following section. Again, the decision ignored clear congressional directives that for other types of limitations EPA must balance costs against effluent reduction benefits—the type of comparison that the Second Circuit says is precluded when EPA establishes cooling water intake structure requirements under section 316(b).

C. Assuming Further that the Most Stringent Criteria for Establishing Effluent Limitations Apply Also to Cooling Water Intakes Is Unjustified.

The Second Circuit's rejection of EPA's interpretation of section 316(b) rests on the lower court's comparison of section 301's Best Practicable Technology ("BPT") level of control, in which EPA is specifically required, through reference to section 304(b), to consider the relationship of costs to benefits, and the BAT level, for which such a cost-benefit balancing is not required.[9] "This shift from BPT to BAT fundamentally altered the way in which the EPA could factor cost into its CWA determinations." Pet. App. 21a.

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[9] *See* CWA § 304(b)(2)(B) (effluent reduction benefits not listed as a factor the Administrator "shall take into account"—although "such other factors as the Administrator deems appropriate" is). (In a further leap, the Second Circuit asserts that cost-benefit analysis not only is not required, it is "no longer permitted." Pet App. 23a.)

In the lower court's view, "[t]he shift from the BPT standard to the more stringent BAT one clearly signaled Congress's intent to move cost considerations under the CWA from a cost-benefit analysis to a cost-effectiveness one." *Id.* at 22a.[10]

But in fact, the "shift" from BPT to BAT clearly did not reflect a congressional decision to abandon consideration of benefits for Clean Water Act programs generally after 1984, nor even for effluent limitations generally. As an initial matter, the Second Circuit did not provide sufficient justification for ignoring the criteria for BPT effluent limitations in sections 301 and 304 and focusing solely on BAT. *Cf.* Pet. App. 21a-23a. There is no obvious reason why cross-referencing section 301 would implicate only the criteria for BAT and not those for BPT. For one thing, section 316(b) was included in the 1972 Federal Water Pollution Control Act Amendments, and so for the first 12 years that section 316(b) was in effect the only applicable criteria for establishing effluent guidelines were those for BPT in sections 301(b)(1)(A) and 304(b)(1).[11] If, as the Second Circuit suggests, the cross-reference to section 301 in section 316(b) means that EPA must look to BAT, rather than BPT, for guidance in establishing requirements

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[10] The opinion below offers no explanation for its extrapolation from criteria for setting effluent limitations in section 304(b) to "CWA determinations" and "cost considerations under the CWA" generally.

[11] Initially, BAT was to be required as of 1983; the effective date for BAT was changed to 1984 in 1977 amendments to the act. *See* n. 6, *supra*.

under 316(b) because section 316(b) contains the word "available" but not the word "practicable," *see* Pet. App. 31a, then one must also assume that Congress intended, by using those words, that for the first 11-12 years of the CWA cooling water intake structures would be subject to a more stringent performance criterion than wastewater discharges. There is no evidence that Congress intended such an illogical result.

Moreover, the Second Circuit seems to assume that BPT is no longer relevant after 1984, but in fact EPA has continued to establish BPT effluent limitations guidelines, with court approval. *Compare* Pet App. 21a (BAT "replaced" BPT) and 30a (BPT is "obsolete") *with Chem. Mfrs. Ass'n*, 870 F.2d at 206-207 (Best Conventional Technology intended "to supplement, rather than to replace, BPT" for conventional pollutants, and Congress in 1987 enacted "a stricter BPT" that applies to "all BPT regulations for all pollutants" promulgated after 1981). The Second Circuit had no more reason for assuming that the cross-reference in section 316(b) to section 301 incorporated the BAT factors than assuming that the BPT factors under section 301 apply, which "do not require an industrial category to commit the maximum economic resources possible to pollution control, even if affordable."[12]

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[12] *See Nat'l Crushed Stone*, 449 U.S. at 75. *See also* Remarks of Rep. Clark during House consideration of Conference Report on S. 2770 (Fed. Water Pollution Control Act Amendments of 1972), 123 Cong. Rec. H9133 (daily ed. Oct. 4, 1972), reprinted in 1 Legis. Hist. 273-74 (section 316 must be read with several other sections of the bill, including "[s]imilar language . . . contained in section 304 concerning factors to be considered in assessing 'best practicable' and 'best available' technology").

Even considering the types of technology-based effluent limitations under section 301 that first began to apply in 1984, however, does not lead to the conclusion that Congress intended that EPA avoid consideration of the benefits to be achieved for Clean Water Act programs generally, or even for effluent limitations. The Second Circuit failed to mention at all Congress' enactment of the Best Conventional Technology ("BCT") level of control for "conventional pollutants," in CWA sections 301(b)(2)(E) and 304(b)(4), 33 U.S.C. §§ 1311(b)(2)(E) and 1314(b)(4). Congress adopted the BCT provisions precisely to avoid the type of "treatment for treatment's sake"—requiring additional technology that is affordable but will not produce significant effluent reduction benefits—that the Second Circuit now claims Congress intended to incorporate by implication into section 316(b). *See Am. Paper Inst. v. EPA*, 660 F.2d 954, 957-58 (4th Cir. 1981); *BP Exploration & Oil, Inc. v EPA*, 66 F.3d 784, 790 (6th Cir. 1995) (Congress recognized that "stringent BAT standards might require unnecessary treatment" of conventional pollutants and "intended for BCT to prevent the implementation of technology for technology's sake"); *Chem. Mfrs. Ass'n*, 870 F.2d at 205 (additional technology may be required only where additional "cheap pounds" of conventional pollutants can be removed). Thus, the Second Circuit's reliance on its assertion that a "shift from BPT to BAT fundamentally altered the way in which the EPA could factor cost into its CWA determinations," Pet App. 21a—without acknowledging that Congress acted directly to *avoid* additional treatment costs *unless* they would produce clear effluent reduction benefits when it enacted BCT—represents an arbitrary focus on one aspect of CWA section 301 and its legislative history, and not another.

Moreover, Congress has acted to avoid requiring additional technology that will not produce significant benefits even in the BAT provisions of the Act. For certain "nonconventional" pollutants (not designated "conventional" pollutants covered by BCT and not listed toxic pollutants), Congress adopted a provision allowing relaxation of requirements based on BAT, to a level (not less than that required by BPT) that will not cause unacceptable water quality in the receiving waters. CWA § 301(g), 33 U.S.C. § 1311(g) (added by § 43 of the Clean Water Act of 1977, Pub. L. 95-27, 91 Stat. 1583); *see Chem. Mfrs. Ass'n v. Natural Res. Def. Council, Inc.*, 470 U.S. 116, 122-23, 127 (1985). Again, Congress acted to avoid unnecessary incremental wastewater treatment technology, because the BPT step had "proven more stringent in many instances than anticipated" and so "will result in a larger measure of progress toward the achievement of the goals of the Act." *See* H.R. Rep. No. 95-830, 95th Cong., 2d Sess. 85 (Dec. 7, 1977), reprinted in 1978 U.S.C.C.A.N. 6668. Again, the Second Circuit failed even to mention this contradiction to its conclusion that Congress has decided to require the most effective technology that a category of discharger can afford, without regard to the incremental benefits or lack thereof from employing that technology.[13]

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[13] *Cf. Chem. Mfrs. Ass'n*, 870 F.2d at 196 (in establishing effluent limitations guidelines, "cost factor is accorded less weight . . . for discharges more harmful to the environment").

D. The Second Circuit's Understanding of EPA's Discretion to Consider Costs and Benefits in Setting BAT Effluent Guidelines for Toxic Pollutants Is Flawed.

Even the BAT standard for listed toxic pollutants (for which the adjustment allowed by CWA section 301(g) is not available, *see* CWA section 301(l), 33 U.S.C. § 1311(l)) does not preclude consideration of the costs in comparison to the benefits, as the Second Circuit claims. In fact, in other decisions, the Second Circuit has acknowledged that "cost is only one of the factors that EPA is supposed to consider in establishing BAT standards," and the statute also specifies "that the EPA should consider" "the cost of achieving such effluent reduction" along with a number of other factors, including "such other factors as the Administrator deems appropriate." *Waterkeeper Alliance, Inc. v EPA*, 399 F.3d 486, 516 (2nd Cir. 2005), *quoting* CWA section 304(b)(2)(B). "However, the Clean Water Act 'does not state what weight should be accorded to the relevant factors; rather, the Act gives EPA the discretion to make those determinations.'" *Id.*, *quoting BP Exploration*, 66 F.3d at 802; *accord, Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045 (D. C. Cir. 1978). In fact, the Second Circuit has even suggested in a previous opinion that it would be illogical for EPA *not* to take into account, when establishing requirements under section 316(b), a situation where expensive technology produces relatively little incremental benefit. *Riverkeeper, Inc. v. U.S. EPA*, 358 F.3d 174, 194 n.22 (2nd Cir. 2004) ("*Riverkeeper I*") ("We think it is logical for the EPA to compare the improvements that both dry cooling and closed-cycle cooling offer over once-through

cooling. . . . [I]t is undeniably relevant that [dry cooling] represents a relatively small improvement over closed-cycle cooling at a very significant cost.").

Other courts have also reached the obvious conclusion that the language of sections 301(b)(2)(A) and 304(b)(2)(B) is broad enough to allow EPA to base BAT effluent limitations in part on its assessment of the costs versus the benefits of candidate technologies. "The courts of appeals have consistently held that Congress intended Section 304(b) to give the EPA broad discretion in considering the cost of pollution abatement in relation to its benefits. . . ." *Chem. Mfrs. Ass'n*, 870 F.2d at 204 (citations omitted); *id.* at 207. *See also, e.g., Natural Res. Def. Council, Inc. v. EPA*, 863 F.2d 1420, 1426 (9th Cir. 1988) ("EPA has considerable discretion in weighing the costs of BAT.") (citations omitted). The cases cited by the Second Circuit, and indeed most if not all of the decisions addressing the issue, have said that EPA is not required to do a cost-benefit balancing for BAT, but not that EPA is precluded from doing so. *See, e.g., Rybachek v. EPA*, 904 F.2d 1276, 1290-91 (9th Cir. 1990) (". . . EPA must consider the 'cost' of meeting BAT limitations, but *need not* compare such cost with the benefits of effluent reduction. . . . The Agency measures costs on a 'reasonableness standard'; it has considerable discretion in weighing the technology's costs...") (emphasis added, citations omitted); *Am. Petroleum Inst. v. EPA*, 787 F.2d 965, 972 (5th Cir. 1986); *Our Children's Earth Found. v. U.S. EPA*, 527 F.3d 842, 849 n.5 (9th Cir. 2008) (EPA has "discretion" to consider other factors, "including harm or risk-based factors").

The Second Circuit's analysis does not even make sense on its face: The Second Circuit views EPA's proper role is determining whether the cost of wastewater treatment technology—and therefore also the cost of a candidate cooling water intake technology—"could not be reasonably borne by the industry." Pet App. 33a; *see also id.* at 24a-26a. Yet the question of whether a cost is "reasonable" cannot be resolved in a vacuum. Whether it is reasonable to buy an automobile for $50,000 may depend on a number of things in addition to whether one has more than $50,000 in the bank; certainly a key consideration is what you are getting for the money—a 10-year-old minivan or a new luxury sports car?—and how it compares to what you could buy for less money.[14] The Second Circuit's notion that an industry can "reasonably bear" the costs of additional technology so long as a significant portion of the industry will not be forced out of business is not "reasonable" at all.[15] Nor is it a sensible description of the "best"

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[14] The Second Circuit recognized this in *Riverkeeper I*, 358 F.3d at 194 n. 22 ("when noting how much more expensive dry cooling is than closed-cycle cooling, it is only fair to note how much more effective it is as well....[I]t is undeniably relevant that that difference represents a relatively small improvement over closed-cycle cooling at a very significant cost.").

[15] *See* Pet. App. 27a-28a (equating "economically feasible" with "reasonable"). *Cf. Am. Petroleum Inst.*, 787 F.2d at 972-73 (implying it would not be "reasonable" for EPA to "tilt at windmills by imposing BAT limitations which removed de minimis amounts of polluting agents from our nation's waters, while imposing possibly disabling costs upon the regulated industry.").

technology for minimizing adverse environmental impact.[16]

The only example the Second Circuit offers of when the Clean Water Act would allow EPA to consider costs and benefits in establishing requirements for wastewater discharges under section 301 or cooling water intake structures under section 316(b) is nonsensical: If there are two or more economically feasible technologies "that produce essentially the same benefits but have markedly different costs," EPA may "choose a less expensive technology that achieves essentially the same results as the benchmark."[17] But EPA promulgates effluent limitations or other permit conditions, based on what the available technology or technologies it identifies can achieve, rather than mandating that a facility install any particular technology. *See, e.g., Rybachek*, 904 F.2d at 1298; *Natural Res. Def. Council*, 822 F.2d at 122-23. Thus, if

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[16] The Second Circuit's view that a technology option is "best," even if it results in only a slight improvement in environmental performance at far higher costs, not only is *not* the only "permissible" reading of the statutory language, it is not even a facially reasonable one. *See BP Exploration*, 66 F.3d at 796 ("[T]he CWA's requirement that EPA choose the 'best' technology does not mean that the chosen technology must be the best pollutant removal. Obviously, BAT . . . must be acceptable on the basis of numerous factors, only one of which is pollution control.")

[17] Pet. App. 26a-28a. *See also id.* at 23a ("cost-effectiveness considerations, like BAT, determine which means will be used to reach a specified level of benefit that has already been established." (footnote omitted)).

EPA, when developing BAT effluent requirements or BTA cooling water intake structure requirements, "chooses," as the identified technology basis for the rule, a less-expensive technology that achieves the same result, that would not make any difference in the wastewater discharge limitations or cooling water intake structure permit conditions that the permitted facility would be required to meet.

This "cost-effectiveness analysis" that the Second Circuit concluded EPA may engage in, Pet. App. 26a-28a, not only is essentially meaningless as the Second Circuit described it, it is vague and undefined. Although the Second Circuit says its test is completely different from a "cost-benefit analysis" that EPA performs in setting BPT effluent limitations, *id.* 24a-26a, 29a, EPA and other courts have used "cost-effectiveness" analysis to denote such a comparison of costs and benefits used in setting BPT, as well as the analysis used in setting BCT limits.[18] By substituting EPA broad discretion to weigh costs and benefits with an unclear standard that uses the term "cost-effectiveness" differently from how it has been used by EPA and other courts, the Second Circuit is inviting yet more litigation about how EPA may go about setting not only cooling water intake structure requirements, but effluent limitations as well.

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[18] *See, e.g., Am. Iron & Steel Inst. v. EPA*, 568 F.2d 284, 297 (3rd Cir. 1977); *Chem. Mfrs. Ass'n*, 870 F.2d at 206; *Am. Petroleum Inst.*, 540 F.2d 1023, 1037-38 (10th Cir. 1976), *cert. denied*, 430 U.S. 922 (1977) (EPA refers to its analysis for setting BPT limitations as a "cost-effectiveness analysis"); *cf. Ass'n of Pac. Fisheries v. EPA*, 615 F.2d 794, 809 (9th Cir. 1980) (BPT balancing of costs and benefits considers both improved water quality and "amount of pollutants discharged").

III. The Second Circuit's Restrictive Interpretation of CWA Section 301, if Not Corrected by the Court, Could Have Significant Adverse Effects Beyond Regulation of Cooling Water Intake Structures.

Because the Second Circuit turned to section 301 for "guidance" as to the factors Congress intended EPA to consider in developing requirements for cooling water intake structures under section 316(b), the decision below provides the Second Circuit's interpretation of how costs and benefits may be considered in the establishment of requirements for wastewater discharges under section 301 (through "effluent limitations guidelines"). In so doing, the Second Circuit rejected EPA's interpretation of the statute, and that of other Circuits as well, to find that EPA has only very limited discretion to consider how the costs of wastewater treatment technology relate to incremental reductions in pollutant discharges. *See* Pet. App. 20a-23a.

Because the Second Circuit offered this interpretation of CWA section 301 in the context of determining what factors EPA may consider in assessing best technology available for minimizing adverse environmental impact under CWA section 316(b), rather than in reviewing any effluent limitations imposed by EPA or state authorities under CWA section 301, the decision below may not technically be binding on EPA or state authorities issuing such effluent limitations. Nevertheless, respondents and other advocacy groups likely will claim that the decision below is binding precedent on the extent to which costs and benefits may be taken into account when establishing effluent

limitations, and EPA also might choose to follow the unequivocal language of the Second Circuit's interpretation of section 301.

EPA has already applied section 301 in issuing effluent limitations guidelines under CWA section 304(b), 33 U.S.C. § 1314(b), for dozens of categories of discharges covering a large swath of industrial and commercial activities. *See* 40 C.F.R. pts. 405-471 (2007). The Second Circuit's incorrect view of section 301 could nevertheless have substantial adverse effects on businesses in the future, in a number of ways. EPA is required to consider, "at least annually," whether it is appropriate to revise its effluent limitations guidelines regulations. CWA § 304(b); § 304(m)(1)(A), 33 U.S.C. § 1314(m)(1)(A); *see also* § 301(d), 33 U.S.C. § 1311(d) (review and, if appropriate, revision of effluent limitations every five years). Additionally, EPA must identify and develop effluent limitations guidelines for additional categories of sources which the EPA Administrator determines have non-trivial discharges of toxic or nonconventional pollutants. CWA § 304(m)(1)(B)-(C), 33 U.S.C. § 1314(m)(1)(B)-(C); *Our Children's Earth*, 527 F.3d at 848-52. Moreover, individual wastewater discharge permits may impose case-by-case, best professional judgment effluent limitations implementing section 301 when they are issued or renewed. *See* CWA § 402(a)(1), 33 U.S.C. § 1342(a)(1); 40 C.F.R. § 125.3(a)(2), (c)(2) (2007).

Past experience has shown that it is not unusual for determinations of available technology under section 301 to involve selection among technologies with vastly different, and huge, costs, but little difference in results.

For example, in developing BAT effluent limitations guidelines for bleached pulp and paper mills, EPA considered but ultimately rejected a technology option that cost twice as much—about *a billion dollars more*—while providing only a slight improvement in toxic pollutant discharges and no difference in monetized water quality benefits. *See Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 559 (D.C. Cir. 2002); 63 Fed. Reg. 18,503, 18,551, 18,544-45 (April 15, 1998). In considering BAT effluent limitations for offshore oil drilling platforms, EPA relied on several considerations to reject (with the Sixth Circuit's approval) a wastewater reduction technology that, while probably technically available and economically achievable, would have imposed *over six billion dollars* of additional costs. *See BP Exploration*, 66 F.3d at 796-97. In setting wastewater limits for cattle feedlots, EPA considered an approach that would have caused almost *six times as many* of those facilities to shut down than the case-by-case regulation EPA ultimately chose, but would have produced only about one percent more reduction in nitrogen loading. *Waterkeeper Alliance*, 399 F.3d at 515. As technology inevitably progresses, and there are smaller and smaller remaining amounts of pollutants to be treated, the potential for high-cost treatment technologies that produce little benefit will be even greater in the future.[19]

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[19] *See, e.g., Ass'n of Pac. Fisheries*, 615 F.2d at 818 (acknowledging that "at some point, extremely costly more refined treatment will have a de minimis effect on the receiving waters"); *Chem. Mfrs. Ass'n*, 870 F.2d at 205 (discussing "point at which costs escalate rapidly in relation to benefits"), 207 (EPA has discretion to select "the point of diminishing returns"). *See also Nat'l Ass'n of Metal Finishers*, 719 F.2d at 664 (industry says setting electroplating BPT effluent guidelines just five percent higher would cut compliance costs in half).

The Second Circuit's erroneous interpretation of CWA section 301 therefore has the potential to affect many more facilities than just those that have cooling water intake structures. The potential large adverse financial impact on businesses and, ultimately, the American public if the Second Circuit's restrictive reading of section 301 is applied in developing effluent limitations for wastewater discharges makes it all the more important that the Court correct that erroneous statutory interpretation.

CONCLUSION

For the reasons set forth above, *amici curiae* urge the Court to reverse the decision of the Second Circuit and find that EPA has the discretion to weigh the costs and the pollution reduction or environmental benefits achieved, when considering technology options as the basis for effluent limitations under CWA section 301(b) and cooling water intake structure requirements under CWA section 316(b).

Respectfully submitted,

RUSSELL S. FRYE
Counsel of Record
FRYELAW PLLC
1101 30th Street, N.W. Suite 220
Washington, DC 20007-3769
(202) 572-8267

Counsel for Amici Curiae American Chemistry Council, American Forest & Paper Association, American Iron and Steel Institute, Chamber of Commerce of the United States of America, and National Association of Manufacturers

Dated: July 21, 2008

Of Counsel:

LESLIE A. HULSE
Assistant General Counsel
American Chemistry Council
1300 Wilson Boulevard
Arlington, VA 22209

RICHARD S. WASSERSTROM
American Forest & Paper Association
1111 19th Street, N.W., Suite 800
Washington, DC 20036

ROBIN S. CONRAD
AMAR D. SARWAL
National Chamber Litigation Center, Inc.
1615 H Street, N.W.
Washington, DC 20062

JAN S. AMUNDSON
Senior Vice President & General Counsel
QUENTIN RIEGEL
Vice President, Litigation & Deputy General Counsel
National Association of Manufacturers
1331 Pennsylvania Avenue, N.W.
Washington, DC 20004-1790

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Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

PSEG FOSSIL LLC, *et al.*,

Petitioners,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

UTILITY WATER GROUP,

Petitioner,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF OF *AMICUS CURIAE* FOR THE AMERICAN PETROLEUM INSTITUTE IN SUPPORT OF PETITIONERS

Of Counsel:

HARRY NG
General Counsel
MICHAEL SEE
American Petroleum Institute
1220 L Street, N.W.
Washington, DC 20005-4070

DANIEL P. ALBERS
FREDRIC P. ANDES
DAVID T. BALLARD
BARNES & THORNBURG LLP
One North Wacker Drive
Suite 4400
Chicago, IL 60606-2809
(312) 357-1313

Counsel for Amicus Curiae

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INTEREST OF *AMICUS CURIAE*[1]

The American Petroleum Institute ("API") is a national non-profit trade association headquartered in Washington, DC, which represents over 400 members engaged in all aspects of the petroleum and natural gas industry. API members own and operate existing offshore oil platforms and onshore refinery facilities that use cooling water intake systems that are directly regulated by EPA's final Phase III rule under section 316(b) of the federal Clean Water Act ("CWA"), 33 U.S.C. § 1326(b), the same statutory section that is the subject of this litigation. As such, API's members are affected by and have a strong interest in the question presented to the Court concerning whether EPA can conduct a cost-benefit analysis under CWA § 316(b) in determining the "best technology available for minimizing adverse environmental impact" ("BTA") for cooling water intake structures, and the practical impacts that the Court's holding may have. API frequently represents its members in regulatory and judicial matters involving the CWA.

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[1] Pursuant to Rule 37.6 of the Rules of the Court, API states that no counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than API, or its counsel, made a monetary contribution to its preparation or submission. The parties have consented to the filing of this brief. On June 24, 2008, certain Respondents filed a blanket consent for all amicus briefs. On June 30, 2008, all three Petitioners filed a blanket consent for all amicus briefs. On July 11, 2008, state respondents filed a blanket consent for all amicus briefs. For all other parties, their individual consents are being lodged herewith.

SUMMARY OF ARGUMENT

The API submits this brief in support of the Petitioners' request for reversal of the Second Circuit's decision because: (1) the lower court failed to follow the test this Court established in *Chevron*, (2) complete elimination of cost-benefit analysis from the application of CWA § 316(b) will harm the American economy and consumers by increasing costs of extraction and production of oil and gas in exchange for little or no benefit to aquatic life, (3) acceptance of the Second Circuit's rationale and interpretation of the CWA essentially invalidates another, later Act of Congress and thirty years of regulatory practice, leading to massive regulatory uncertainty under not only the CWA, but every other statute under which administrative agencies regulate, and (4) the Second Circuit's proposed cost effectiveness test would preclude regulatory agencies from regulating in an orderly and efficient fashion.

First, the Second Circuit did not follow *Chevron* and simply substituted its own judgment for EPA's upon the determination that the statute was ambiguous. That decision interpreted CWA § 316(b) as *not* allowing EPA to conduct a cost-benefit analysis when it establishes national uniform standards setting BTA for cooling water intake structures at large, existing power plants.[2] However, the plain language of CWA § 316(b) does not state whether EPA can consider potential technology costs and related effluent reduction benefits, and, in the light most favorable to the Second Circuit's

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[2] The Second Circuit decision is reported as *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d. Cir. 2007).

decision, is ambiguous and subject to multiple, conflicting interpretations concerning the cost-benefit issue. Indeed, the Second Circuit and EPA both interpreted CWA § 316 to reach the exact opposite conclusions. Regardless, the plain language of CWA § 316(b) does not show a clear Congressional mandate prohibiting EPA from considering costs and benefits when establishing the "best" technology available for reducing environmental impacts from cooling water intake structures. As a result, the Second Circuit should have deferred to EPA's reasonable interpretation as required under *Chevron*. Instead, the Second Circuit wholly ignored EPA's interpretation of CWA § 316(b), a statute which EPA administers, and found that the language of CWA § 316(b) clearly establishes that EPA cannot conduct a cost-benefit analysis. In reaching this conclusion, the Second Circuit drew support from the dissimilar language of CWA §§ 301 and 306, and borrowed interpretations of those provisions to bolster its examination of CWA § 316(b). This analysis directly conflicts with the well-established *Chevron* framework, which, if conducted below, would have deferred to EPA's interpretation. The Second Circuit's failure to follow *Chevron* and defer to EPA's interpretation of CWA § 316(b) requires reversal.

API further submits this brief to describe the potential dramatic impacts that the Second Circuit decision may have on the regulated community. Though the Second Circuit overturned the Phase II rule only as it pertains to national uniform standards, and API's members' permits under the Phase III rule are granted with controls using the "best professional judgment" ("BPJ") of individual permitting officials, the Second

Circuit's decision could be misread to include permitting decisions. If the Second Circuit decision is upheld, EPA permit writers confronted with a Supreme Court decision disallowing cost-benefit considerations in setting national uniform standards will likely also conclude that they are prohibited from considering costs and benefits in exercising their BPJ for permit conditions.

It is difficult to overestimate the negative impact to the American economy the Second Circuit's decision will have if it is upheld by this Court and applied to our domestic oil and gas industry. Should the Court order EPA to completely forego cost-benefit considerations in implementing CWA § 316(b), EPA's response will likely be to impose billions of dollars of costs on energy consumers with little or no corresponding environmental benefit. EPA estimated the costs of a conversion to closed-cycle cooling systems for Phase II electrical power plants at up to $200 million per facility, plus a nationwide "social cost" of $3.5 billion *per year*. In the Phase II rulemaking, EPA further recognized that even these high cost estimates could *double* based on the need for Phase II facilities to acquire property needed to construct new cooling towers for the closed-cycle systems.

The economic impact from the application of the Second Circuit's decision to Phase III production and refinery facilities would dwarf the Phase II costs. Forced conversion to closed-cycle systems where needed for Phase III facilities could make domestic gasoline production and refining unprofitable at today's prices or impose massive new energy costs through price

increases. Should this Court uphold the Second Circuit's decision and impose these costs on the industry, the country will likely endure substantial energy cost increases during an already strained economic period. This outcome would be even less defensible because it comes with marginal or no environmental benefits.

Further, the Second Circuit decision, if upheld, will create broad uncertainty for both EPA and the regulated community. Since 1977, EPA and state agencies have been developing standards for facilities based on their BPJ on a site-specific basis. As it made clear before the Second Circuit, during that time EPA, as well as state agencies, weighed costs and related benefits under CWA § 316(b) in setting BPJ standards. The regulated community relied on EPA and state standards based on these cost-benefit analyses in making substantial investments to install compliance measures. By now requiring closed-cycle cooling systems to be installed because EPA purportedly erred in conducting a cost-benefit analysis for the Phase II Rule, facilities will be forced to forfeit their substantial investments to implement other compliance measures. API submits this brief because of its concerns about these detrimental impacts that may result from the decision below.

Finally, if this Court adopts a position that disallows cost-benefit analysis where the statute is silent, the result will be the nullification of an act of Congress—the Regulatory Flexibility Act of 1980 (5 U.S.C. §§ 601-612)—and the overturning of thirty years of bipartisan regulatory policy. The result could be a dramatic reduction in the ability of the Federal government to

regulate effectively. Agencies implementing limited statutory sections such as CWA § 316(b) could be confronted with vocal and litigious advocates, such as the environmental petitioners in the Second Circuit, forcing agencies to adopt absurdly costly regulatory alternatives with little correspondence benefits.

For all of the above reasons, the Second Circuit's decision should be reversed.

BACKGROUND

In the CWA amendments of 1972, Congress enacted CWA § 316(b). 33 U.S.C. § 1326(b). That provision provides the mechanism for EPA to regulate cooling water intake structures. *Id.* CWA § 316(b) provides as follows:

> Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."

Id. Unlike other CWA provisions, CWA § 316(b) relates not to the quality or quantity of discharges to surface waters, but to the "location, design, construction, and capacity of cooling water intake structures"—that is, structures that are constructed in surface water bodies to enable the withdrawal of cooling water. *Id.* CWA § 316(b) does not explicitly provide any language that addresses how or to what extent EPA considers costs and benefits in establishing BTA.

EPA defines "cooling water intake structure" as "the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the United States." 69 Fed. Reg. 41,576, 41,580 (July 9, 2004). Facilities with cooling water intake structures include power plants and industrial facilities that are constructed near water bodies so they can circulate water through their equipment to cool the heat generated during operations. Over 90 percent of the volume of cooling water withdrawn from surface waters in the United States is used by electric utility generating stations with a total design flow over 50 MGD. 71 Fed. Reg. 35,006, 35,017 (June 16, 2006). Of the many thousands of industrial facilities that withdraw cooling water, EPA estimates that approximately 550 nationwide withdraw 50 MGD or more, and most of these are electrical generation facilities. 69 Fed. Reg. at 41,608. In contrast, there are almost 4,000 offshore oil platforms in the Gulf of Mexico and 150 refineries within the continental United States. *See* Coastal Marine Institute, Forecasting the Number of Offshore Platforms on the Gulf of Mexico OCS to the Year 2023 (April 2001) <http://www.gomr.mms.gov/PI/PDFImages/ESPIS/3/3104.pdf>; Energy Information Administration, *Number and Capacity of Petroleum Refineries*(visited July 18, 2008), *<http://tonto.eia.doe.gov/dnav/pet/pet_pnp_cap1_dcu_nus_a.htm>*.

Offshore platforms extract oil from the geological structures under the ocean floor. Given the danger posed by fire and explosions in drilling through gas and oil pockets, offshore platforms generally use ocean water primarily for fire suppression and cooling operations. Offshore platforms also use ocean water for cooling any

drilling operations. EPA Technical Development Document for the Final Section 316(b) Phase III Rule, pp. 2-8 – 2-10 (EPA-821-R-06-003). These operations generally use very little ocean water in comparison with the amounts used by onshore electrical generation facilities. 71 Fed. Reg. at 35,017. Similarly, onshore oil refineries also use cooling water primarily for cooling drilling and fire suppression. Refineries use much less water than electrical generation facilities. Onshore refineries are inherently dangerous facilities. Crude oil molecules are "cracked" at extremely high temperatures and pressures in massive containers, to produce gasoline, kerosene, lubricants, and all the petroleum products modern society requires to function. Cooling water is used to maintain production equipment at proper operating temperatures, which, among other things, ensures proper safety at the refineries.

The primary environmental impact from cooling water intake structures is that they "impinge" and "entrain" aquatic organisms, from the smallest plankton, fish, eggs, and larvae to the largest adult fish. "Impingement" is when organisms are trapped against intake structures by inflowing water, which can cause physical injury; "entrainment" occurs when smaller organisms are pulled into a facility's cooling system, which can cause injury from exposure to the facility's operations. *Id.* at 41,586. Because of these impacts on aquatic life, the Phase II Rule was promulgated "to minimize the adverse environmental impacts of cooling water intake structures by minimizing the number of aquatic organisms lost as a result of water withdrawals associated with these structures or through restoration measures that compensate for these losses." *Id.* at 41,586.

There are three primary technological systems for cooling at electric utilities and industrial facilities: once-through, closed-cycle, and air/dry. "Once-through" cooling systems used by most existing plants are more cost-effective and energy-efficient than "closed-cycle" cooling systems, which recirculate water through cooling towers, or "air/dry" cooling systems that use virtually no water. Once-through systems, however, require a larger volume of intake water, which can potentially have a more significant impact on aquatic life. Regardless of the volume of water withdrawn by a particular type of cooling system, there are other practical and environmental considerations. For example, closed-cycle and air/dry cooling systems can be extraordinarily more expensive than once-through cooling, requiring, in the case of closed-cycle systems, existing facilities to install retrofit systems that can reduce electric generating capacity, which leads to an "energy penalty" while the retrofit is installed. Also, closed-cycle and air/dry cooling systems require more electricity to operate and create additional adverse environmental impacts such as increased air pollutant emissions resulting from greater use of fossil fuels. *Id.* at 41,605.

API's members were regulated by EPA under the Phase III rule issued on June 16, 2006, whereas electrical generation facilities were regulated under the Phase II rule, issued on July 9, 2004. The Phase II Rule covers approximately 90 percent of the total volume of cooling water withdrawn by all facilities nationally. 71 Fed. Reg. at 35,017. In promulgating national standards for the Phase II Rule based on BTA, EPA determined that Phase II facilities could choose from five technology alternatives for

achieving the BTA "to provide a significant degree of flexibility to Phase II existing facilities, to ensure that the rule requirements are economically practicable, and to provide the ability for Phase II existing facilities to address unique site-specific factors." 69 Fed. Reg. at 41,590. EPA found that Phase II facilities should have the choice of the five alternatives to satisfy BTA because adoption of a single technology standard for all Phase II facilities was not practicable. *Id.* Instead, EPA determined that the "range of technologies" was "commercially available" for the industry and the most appropriate approach for addressing the variability among Phase II facilities. *Id.* at 41,599. The Phase II Rule also set forth national performance standards that consist of "ranges of reductions" that facilities must achieve in impingement or entrainment from a "calculation baseline." *Id.* at 41,683-84, 41,590.

EPA determined that "closed-cycle, recirculating cooling systems" did not represent the single BTA for Phase II facilities based on its "high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations." *Id.* at 41,605. EPA found that requiring closed-cycle cooling retrofits at Phase II facilities "is not the most cost-effective approach," and that "retrofits may be *impossible* or not economically practicable." *Id.* (emphasis added). Specifically, EPA reviewed evidence showing that the costs of closed-cycle retrofits would be exceedingly high-ranging per facility, from an estimated $130 to $200 million in capital costs and $4 to $20 million in annual operating costs. *Id.* Indeed, "EPA estimated that the total social cost of compliance for this

option for Phase II existing facilities would be approximately $3.5 billion per year." *Id.* EPA then found that actual costs could be "at least twice those projected" because its estimates "did not fully incorporate costs associated with acquiring land needed for cooling towers, and, therefore, these estimates may not fully reflect the costs of the option." *Id.*

EPA also considered information about the energy impacts associated with closed-cycle retrofits. This included EPA's finding that if Phase II facilities were required to install closed-cycle cooling systems, the Department of Energy estimated "on average 20 additional 400-MW plants might have to be built to replace the generating capacity lost by replacing once-through cooling systems with wet cooling towers if such towers were required by all Phase II facilities." *Id.* Moreover, EPA found that because that "deficit is predicted to occur during the summer months (when energy demand is highest), the net effect would be more consumption of fossil fuel, which in turn increases the emission of sulfur dioxide, NO[X], particulate matter, mercury and carbon dioxide." *Id.* EPA found it appropriate "to consider these non-water quality environmental impacts and the additional costs associated with controlling these increased emissions in" issuing the Phase II Rule. *Id.*

EPA determined that it was authorized to conduct a cost-benefit analysis in establishing BTA under CWA § 316(b). While EPA looked to CWA §§ 301 and 304 to a limited extent, EPA also explained the differences between those provisions and CWA § 316(b). 69 Fed. Reg. at 41,583. EPA found that in contrast to

CWA §§ 301 and 304, the object of BTA "is explicitly articulated by reference to the receiving water: To minimize adverse environmental impact in the waters from which cooling water is withdrawn." *Id.* Because of the differences in the language of the CWA provisions, EPA explained that they were implemented differently:

> While EPA has established effluent limitations guidelines based on the efficacy of one or more technologies to reduce pollutants in wastewater in relation to cost without necessarily considering the impact on the receiving waters, EPA has previously considered the costs of technologies in relation to the benefits of minimizing adverse environmental impact in establishing 316(b) limits which historically have been done on a case-by case basis.

Id. Thus, EPA concluded that "[f]or this Phase II Rulemaking, EPA . . . interprets CWA section 316(b) as authorizing EPA to consider not only technologies but also their effects on and benefits to the water from which the cooling water is withdrawn." *Id.* Based on its cost-benefit analysis, EPA established in the Phase II Rule "national requirements for facilities to install technology that is technically available, economically practicable, and cost-effective while at the same time authorizing a range of technologies that achieve comparable reductions in adverse environmental impact." *Id.*

In the Phase III rule, EPA determined that national uniform standards for implementing BTA among the widely varied smaller facilities was not

appropriate. EPA found that the cost of establishing a single, uniform standard for existing onshore refineries and offshore rigs was wholly disproportionate to any environmental benefits, and decided to provide permit writers with the authority to make case-by-case decisions on the BTA for a particular facility. 71 Fed. Reg. at 35,014-17.

ARGUMENT

The sole question raised by the Court is whether EPA can compare costs and benefits under CWA § 316(b) in establishing BTA for cooling water intake structures. The Second Circuit incorrectly denied EPA's ability under CWA § 316(b) to consider cost and benefits in determining a reasonable regulatory approach, stating that "[w]hen Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute," and that EPA may only consider regulatory costs to the extent that an industry can "reasonably bear" technology costs and the technology is "cost effective." *Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 99-100 (2nd Cir. 2007). The Second Circuit's decision must be overturned because: (1) the court improperly substituted its own interpretation of an arguably silent statutory section for an agency's permissible interpretation; (2) the Second Circuit's interpretation of the CWA is likely to cause immediate massive harm to the domestic petroleum industry, American consumers, and the U.S. economy, in exchange for little to no benefit to aquatic life; (3) the Second Circuit's decision would essentially invalidate a later Act of Congress and reverse close to thirty years of regulatory policy by that uses common sense and cost-

benefit analyses in favor of an ill-defined and impracticable analysis forwarded by one panel of one Circuit Court of Appeals; and (4) the Second Circuit's proposed cost effectiveness test would preclude regulatory agencies from regulating in an orderly and efficient fashion.

I. CWA § 316(b) authorizes EPA to compare costs and benefits for determining BTA.

EPA's interpretation of the phrase "best available technology for minimizing adverse environmental impacts" is that it authorizes EPA to consider, in establishing standards for cooling water intake structures based on such technology, the relationship of the costs of the technology options to the benefits associated with them. 69 Fed. Reg. at 41,583, 41,603. The Second Circuit ignored EPA's interpretation of CWA § 316(b), and instead read non-existent language into CWA § 316(b) prohibiting EPA from considering costs and benefits. *Riverkeeper*, 475 F.3d at 98-99. A proper *Chevron* analysis, however, shows that the Second Circuit should have deferred to EPA's reasonable interpretation of CWA § 316(b), a statute that is silent concerning the question at issue.

Under *Chevron*, if the intent of Congress is clear from the statute, then the Court must give effect to that intent. *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842 (1984). But, if "the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute." *Id.* at 842-43. The plain language of CWA § 316(b) is silent concerning whether

or how EPA is permitted to weigh costs (or indeed, any other factor) when determining BTA. Indeed, the Second Circuit recognized the statute's silence on this issue: "Section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that the EPA must consider in determining BTA." *Riverkeeper*, 475 F.3d at 97.

Despite its recognition of the absence of language in CWA § 316(b) that would prohibit EPA from considering costs or conducting a cost-benefit analysis, the Second Circuit held that "the language of section 316(b) itself plainly indicates that facilities must adopt the *best* technology available and that cost-benefit analysis cannot be justified in light of Congress's directive." *Id.* at 98-99 (emphasis in original). However, a critical examination of CWA § 316(b) shows that its language is silent or, at best, ambiguous, considering EPA's reasonable interpretation to the contrary. The Second Circuit's interpretation ignores that CWA § 316(b) not only lacks a directive to EPA about how it is to consider costs of technology, but it contains an affirmative provision that EPA consider not only available technology, but also what is "best" for "minimizing adverse environmental impact." This language distinguishes BTA from almost all other CWA standards, that typically focus on the feasibility of technology, and instead focuses on environmental impacts. The Second Circuit mistakenly read the language of CWA § 316(b) as "expressly requir[ing] a technology-driven result . . . , not one driven by cost considerations or an assessment of the desirability of reducing adverse environmental impacts in light of the cost of doing so." *Id.* at 99. However, the Second Circuit

only focused on the words "best technology available," failing to recognize that "minimizing adverse environmental impact" modifies the first three words of BTA. *Id.* In comparison to the Second Circuit's incomplete interpretation, a proper construction of CWA § 316(b) permits EPA the discretion to weigh costs and benefits in determining whether a technology for a cooling water intake structure is the "best . . . achievable" allowing for consideration of costs, while also determining such technology minimizes adverse environmental impact, thus allowing EPA to consider environmental benefits. Thus, the Second Circuit erred in finding that the plain language of CWA § 316(b) clearly sets forth a Congressional mandate prohibiting EPA from conducting a cost-benefit assessment.

Because the language of CWA § 316(b) does not unambiguously state Congress' intent on the cost-benefit issue under step one of the *Chevron* analysis, the Second Circuit should have deferred to EPA's interpretation of the statute. For the Phase II Rule, EPA interpreted CWA § 316(b) as allowing for a consideration of "the national cost of . . . technologies in comparison to the national benefits . . ." 69 Fed. Reg. at 41,603; *see also id.* at 41,583. Because CWA § 316(b) does not expressly prohibit EPA from comparing costs and benefits in establishing BTA, the Second Circuit should have deferred to EPA's interpretation so long as it was reasonable. *Chevron*, 467 U.S. at 843. As thoroughly discussed in briefs submitted by other parties, including EPA itself, EPA's interpretation of CWA § 316(b) as allowing it to compare costs and benefits in establishing BTA was reasonable. The text of CWA § 316(b) supports EPA's reasonable interpretation, which states that

intake structures "reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). This language, unique to the CWA, combines technology considerations ("best technology available") with environmental goals ("minimizing adverse environmental impact."). As a result, EPA reasonably interpreted CWA § 316(b) to grant it the authority to consider technology costs in relation to environmental benefits, such as related reductions in impingement and entrainment for the Phase II facilities. 69 Fed. Reg. at 41,603. Because it failed to conduct a proper *Chevron* analysis that defers to EPA's reasonable interpretation of CWA § 316(b), the Second Circuit decision should be reversed.

II. If upheld, the Second Circuit's decision is likely to lead to major impacts on our nation's energy supply.

If the Second Circuit's decision is upheld, EPA's cost-benefit analysis for the Phase II Rule is invalidated, and closed-cycle cooling systems are imposed on Phase II and III facilities as BTA, the practical implications will be broad and substantial on the already-strained energy industry. If closed-cycle systems are imposed as BTA, the oil and gas industry could likely be required to retrofit existing refineries and existing offshore oil platforms. Requiring a possible shut down of either one of these to retrofit systems would impose costs on the oil and gas industry that would necessarily be passed on to consumers and harm the American economy. Finally, reversing EPA's use of cost-benefit analysis in establishing BTA over the last thirty years will lead to regulatory uncertainty and unnecessary expenditures.

First, retrofitting an oil refinery with closed-cycle cooling water systems may require a shutdown of the entire refinery, which will not only raise costs for the refinery, but could reduce the supply of gasoline and other products to consumers. Just the cost of adding a cooling tower to a refinery to support closed-cycle cooling, even ignoring any costs imposed through closure of the refinery for ten months, is likely to be high, at possibly over $6,000,000 per unit. Again, this estimate includes only the construction of the unit. The significant cost would be required because the typical petroleum refinery is a complex system of process components that evolved over decades. Designers provided heat removal systems based upon the needs of the individual components and the available cooling utilities. Changing once-through cooling systems to recirculating systems will involve site-specific piping and equipment location issues that may not be apparent to those more familiar with power plants. Each refinery component may have several different heat transfer needs, ranging from pump cooling to steam eduction-generated vacuum. If the cooling tower can provide similar cooling capacity, then the process heat exchangers will not need replacement. The problem is that the temperature difference provided by once-through cooling is not readily replicated with cooling tower-based systems. Consequently, the complex nature of a petroleum refinery will demand site-specific cooling system designs having multiple cooling towers (possibly placed far away from the process unit), the replacement of pumps, and/or the replacement of process heat exchangers (and possible associated piping, depending upon system hydraulics). Moreover, not only are design challenges daunting for refineries, but space restrictions

can increase construction costs exponentially. For example, in the Phase II Rule, EPA recognized that acquisition of property for siting cooling towers could result in costs "at least twice those projected by EPA." 69 Fed. Reg. at 41,605. This issue would equally apply to Phase III facilities.

However, the construction costs are not the largest costs this changeover imposes. In addition to the massive refinery construction costs that would be passed on to consumers, closing even a handful of these at any one time could have massive impacts on the American economy and the supply of gasoline and energy. There are only about 150 refineries in the United States to refine the gasoline and other petroleum products, and those that are in operation are already ruling at full capacity to satisfy consumer demands. Energy Information Administration, *Number and Capacity of Petroleum Refineries*(visited July 18, 2008), <*http://tonto.eia.doe.gov/dnav/pet/pet_pnp_cap1_dcu_nus_a.htm*>. With regards to offshore platforms, a sizable percentage of U.S. domestic production may be shut down for months on end while offshore cooling water systems are reconfigured to specifications designed for onshore electrical generation facilities a couple hundred times their size. Since the companies operating offshore platforms are so large, it is not likely that even the costs of converting offshore platforms would meet the Second Circuit's test of not being able to be "reasonably borne" by the industry. Of course, the economic harm to this country could be massive.

As EPA noted in its Phase II rulemaking, retrofitting closed-cycle systems is no small task, and EPA found that an electrical plant could be down for *up to ten months* while performing necessary construction. 69 Fed. Reg. at 41,605. API agrees with this ten-month downtime estimate. In fact, as API explained in 2005 in response to EPA's request for comments on a rule that would only require retrofitting screens and intakes, not installing cooling towers:

> Petroleum refineries are not designed or operated on the basis of taking periodic routine shut downs. The experiences of emergency shut-downs of refineries due to recent hurricanes explains why shutting down refineries is to be avoided. Typically, a refinery runs 24 hours per day, 7 days per week. Usually, turnarounds are performed on individual process units, while most of the remainder of the refinery remains in operation. In addition, at least one API member's intake structure also provides water to a municipality; this water supply would be curtailed to accomplish the retrofit. Therefore the demand for cooling water at the intake structure is nearly always continuous.
>
> Refineries rarely have suitable alternate [cooling water intake structures]. If retrofit of the intake structure were required, in many cases essentially complete shutdown would be necessary during the installation of a modified intake structure. In each of these cases, API estimates that retrofitting an intake

> structure would typically result in 8 weeks of lost production. For the 13 petroleum refineries potentially subject to Phase III (those with cooling water flows >50 mgd), estimated downtime and lost production time would total approximately 100 weeks.

API, *Comments to Docket OW-2004-0002*, at 5-6 (Dec. 27, 2005). Of course, the eight-week estimate only includes the retrofitting of existing refinery equipment such as intake screens, pipes, and circulation. This estimate does not include the actual construction of necessary new cooling towers or equipment for closed-cycle circulation. It will be necessary for refineries to actually build new towers to implement closed-cycle cooling. API believes that refinery downtime is likely to be in the range of ten months, as EPA previously found, representing a potentially major decrease in gasoline and diesel production, along with comparable losses of other vital petroleum products. During the time refineries were closed for turnaround, they would not be producing any petroleum products. The production stoppage could likely apply to virtually all of this country's domestic gasoline and petroleum refining facilities. In addition, a large number of offshore oil platforms may need to be shut down for conversion. Yet, the Second Circuit's decision would preclude EPA from weighing the costs its regulation could impose against a small benefit to aquatic life.

Finally, adopting the Second Circuit's elimination of cost-benefit analysis in establishing BTA for the Phase III rule would create broad uncertainty for both EPA and the regulated community. After the Fourth

Circuit invalidated EPA's first attempt to implement CWA § 316(b) in *Virginia Electric & Power v. Costle*, 566 F.2d 446 (4th Cir. 1977), EPA and state agencies implemented CWA § 316(b) by developing standards site-by-site, based on their "best professional judgment." 69 Fed. Reg. at 41,584. While EPA and state agencies issued site-specific standards for cooling water intake structures, in 1979, the First Circuit confirmed that CWA § 316(b) authorizes EPA to weigh costs against environmental benefits. *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306, 311 (1st Cir. 1979). As EPA made clear in the Phase II Rule, it was operating consistent with the interpretation that it was authorized to conduct a cost-benefit analysis. The regulated community relied on EPA's interpretation, and based on the standards issued by EPA and state agencies based on site-specific BPJ, Phase II facilities made substantial investments over the last thirty years to install compliance measures. The Second Circuit's decision, however, would require Phase II facilities to forfeit those investments. The loss of those investments makes the cost of installing closed-cycle systems especially daunting, and would likely lead Phase III facilities to conclude that EPA's regulatory actions could not be relied upon.

III. Overturning existing common-sense regulatory law and policy in favor of the Second Circuit's undefined tests would lead to substantial uncertainty under every regulatory statute.

The Second Circuit provided very little guidance to agencies on how to implement its potentially wide-sweeping decision, and upholding its decision on cost-benefit analysis would effectively invalidate thirty years of common-sense regulatory policy in favor of a vague test for what costs can be "reasonably borne" by an industry that the court itself was unwilling to define clearly. In its decision, the Second Circuit appears to have concluded that unless a statute specifically provided for cost-benefit analysis, such analysis would be prohibited. *Riverkeeper*, 475 F.3d at 99. According to the Second Circuit, the only limit on what technology EPA is required to mandate is whether industry can bear the costs. Yet, in its zeal to "force" technology, the Second Circuit declined to even define the vague term "reasonably borne" from its own proposed test. The Second Circuit simply did not explain whether EPA would be permitted to reject a regulatory option that put 5% of an industry out of business, or whether it must engage in "technology forcing" until it was shown that only a handful of firms would remain. *Id.* The Second Circuit has attempted to push aside thirty years of cost-benefit analysis and common sense regulatory policy in favor of forcing the agencies into decades of litigation on the meaning of the word "reasonable" in the various circuits.

The sole guidance the Second Circuit gave to a regulatory agency is to state that the only consideration

the agency could give to costs would be to determine "cost-effectiveness." The Second Circuit's decision appears to continue to mandate each and every technological upgrade that an agency has determined the industry could "reasonably" bear. However, if an agency identified a technological option that had identical benefits at a lower price, it could opt for the lower price technology. Here, the court was very clear, stating that EPA could not reject a regulatory alternative that saved *two additional fish* on cost considerations. *Id.* at 100. In the Second Circuit's opinion, a section of the CWA that is silent on cost-benefit analysis requires EPA to impose billions of dollars in regulatory costs for the projected saving of two fish.

In assessing the unreasonableness of the Second Circuit's sweeping holding, it is helpful to examine current regulatory policy. Currently, in the face of statutes silent on the question of cost-benefit analysis, agencies are required by law to consider the impacts of their actions. Specifically, the Regulatory Flexibility Act of 1980 (the "RFA"), required EPA to consider the costs of its CWA § 316(b) rules to small entities.[3] 5 U.S.C. §§ 601-612. Though the RFA does not "trump" the

[3] In fact, pursuant to section 609 of the RFA, EPA determined the Phase III cooling water intake rule was likely to have a significant economic impact on a substantial number of small entities and conducted a Small Business Review Enforcement Fairness Act panel prior to publication. *See* U.S. Small Business Administration, Office of Advocacy, *SBREFA Panel Support for Cooling Water Phase III Regulations Under Section 316(b) of the Clean Water Act: Final Report* (Jan. 9, 2004) (EPA-HQ-OW 2004-0002-02221).

legislative goals EPA is regulating for, Congress clearly intended that EPA at least consider the costs of the regulatory burdens it is imposing and alternative regulatory approaches to reduce those costs. 5 U.S.C. § 606 ("The requirements of sections 603 and 604 of this title do not alter in any manner standards otherwise applicable by law to agency action."); *see, e.g., A.M.L. International, Inc. v. Daley*, 107 F. Supp. 2d 90, 105 (D. Mass. 2000) ("The RFA does not command an agency to take specific substantive measures, but rather, only to give explicit consideration to less onerous options."). However, the Second Circuit appears to have concluded that a silent statutory section that makes no mention of consideration of costs must be read to mean that RFA analysis is meaningless.

Section 604 of the RFA requires EPA to publish along with their final rules in the *Federal Register* a discussion outlining the types of small entities being regulated, the estimated compliance burdens, as well as less burdensome regulatory alternatives. 5 U.S.C. § 604. EPA must also publish, along with its proposed and final rules, "a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record." 5 U.S.C. §§ 603(b)(4), 604(a)(4). Having determined the likely regulatory burdens, EPA is then required to provide with its final rules:

> [A] description of the steps the agency has taken to minimize the significant economic

> impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

5 U.S.C. § 604(a)(5). EPA decisions to reject less burdensome regulatory alternatives are subject to judicial review under the RFA, and challenges to regulatory actions can be brought by any adversely affected small entity who believes EPA failed to conduct the requisite regulatory flexibility analysis. 5 U.S.C. § 611(a), *see U.S. Telecom. Ass'n. v. FCC*, 400 F.3d 29, 42-43 (D.C. Cir. 2005) (court found substantial compliance with APA notice and comment requirements, but still remanded rule based on failure to conduct regulatory flexibility analysis).

In a legal challenge brought under the Administrative Procedure Act (the "APA"), EPA would understandably be hard-pressed to defend the Second Circuit's proposed cost-effectiveness test in any other Circuit Court of Appeals. Though this Court's *Chevron* standard and the "arbitrary and capricious" standard from the APA generally provide deference to agency decision making (*see Chevron*, 467 U.S. at 842-45; 5 U.S.C. § 706), it would be difficult for a court that did not accept the Second Circuit's rationale for interpreting statutory silence as prohibiting cost-benefit consideration to determine that EPA was not acting arbitrarily if the agency acted exactly as the Second

Circuit urged. First, in determining that a technology cost could be "reasonably borne," the Second Circuit apparently would make no distinction for cases where the largest company in an industry could reasonably bear a cost that would force every small competitor out of business. Consideration of regulatory alternatives under the RFA would become a meaningless act under a judicially-created test with no explicit statutory support.

It is instructive to note that the Second Circuit failed to explain how its cost-effectiveness test would work in reality. The Second Circuit stated that EPA would not be permitted to adopt a technology that failed to save *two fish* more than a test with even significantly less costs, provided EPA had made a prior determination that the industry could "reasonably bear" the costs of the technology. *Riverkeeper*, 475 F.3d at 100. This test is profoundly disconnected with the real world impacts of regulation, as no reasonable, uninterested party would dare to say that an EPA decision to destroy every smaller competitor in a market on behalf of *two fish* was not arbitrary and capricious. Yet, the Second Circuit's choice of example explicitly puts EPA agencies on notice that even reasonable regulatory alternatives will be overturned as impermissible under the court's new cost-effectiveness test.

In addition, the Second Circuit's decision contravenes almost thirty years of regulatory policy. Since 1981, Federal agencies have been required by Executive Order to apply a cost-benefit analysis of to some degree to their regulatory decisions. On February 17, 1981, one of President Reagan's first acts of office

was to sign Executive Order 12,291 requiring Federal agencies to use the common sense principle that, "Regulatory action shall not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society." Exec. Ord. 12,291, at §2(b), 46 Fed. Reg. 13,193 (1981). In a display of the bipartisan nature of this common sense measure, in his first year in office, President Clinton signed Executive Order 12,866, continuing cost-benefit analysis in regulation and even creating an oversight mechanism to ensure this occurred. Exec. Ord. 12,866, 58 Fed. Reg. 51,735 (1993). The Second Circuit's decision steps squarely into the realm of the Executive, ordering the President to interpret statutes that are silent on cost-benefit analysis in the manner that the court prefers.

Given the serious potential for regulatory confusion and legal difficulties present in implementing the Second Circuit's decision, this Court should refrain from upholding the Second Circuit decision to the extent that it purports to prohibit cost-benefit analysis unless specifically granted in the authorizing statute. To the extent that this Court finds the Second Circuit's analysis and interpretation of CWA § 316(b) acceptable, API urges the Court to limit its holding to only implementation of CWA § 316(b).

IV. A general prohibition on regulatory decisions based on cost-benefit analysis would destroy the ability of regulatory agencies to regulate in an orderly and efficient fashion.

Though API believes the Second Circuit's interpretation of the CWA was not proper under this Court's prior decisions, API strongly urges this Court to limit any decision upholding the Second Circuit's decision to the confines of CWA § 316(b) only. API's members are regulated not only under the CWA, but under the numerous other environmental, health, safety, and economic statutory schemes. If this Court accepts the general holding of the Second Circuit on cost-benefit analysis and proper statutory interpretation, without limitation to the CWA, there is no limit to the disruption that such a rule could cause. Two outcomes would necessarily occur, should this Court accept the Second Circuit's rationale and adopt the general rule that unless a statute mandates cost-benefit analysis, such analysis is prohibited: (1) regulatory agencies will interpret the Second Circuit's "reasonably borne" cost limitation as an order to regulate such that industry spend every penny of profit to reach that particular agency's narrow regulatory goal; and/or (2) executive authority to implement statutes will be taken over by the courts, as there will be endless litigation by special interest groups claiming that agencies do not have authority to give industry a break for any marginal cost, where regulatory benefits are potentially available. In 2005 alone, the Federal government published 3,980 final rules, many of which are silent as to cost factors and may have to ignore cost considerations under the Second Circuit's rationale. *See* Office of Management

and the Budget, Office of Information and Regulatory Affairs, *2006 Report to Congress on the Benefits and Costs of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities*, at 7 (2006) (visited on July 18, 2008) <*http://www.whitehouse.gov/omb/inforeg/2006_cb/2006_cb_final_report.pdf*>. Just the 2005 final rules imposed annual regulatory costs of between $4,329,000,000 to $6,597,000,000, even after the agencies were forced to consider costs and regulate in a common sense manner. *Id.* If the Second Circuit decision was followed, those costs would likely have been much higher.

Regulated companies have few choices when faced with regulatory costs. They can try to absorb the costs, or, in cases like this where the entire industry is being regulated, they can raise prices and pass costs to consumers. Yet, there is a limit to what the market will bear. When one reviews just how many statutory grants of regulatory authority are silent on the issue of cost-benefit analysis, the inevitable conclusion is that there simply is not enough money to satisfy all of the agencies' regulatory priorities without comparing costs and benefits. This Court's decision has the potential to influence outcomes far beyond the scope of the minor statutory section of CWA § 316(b), and API urges this Court to tailor its final opinion in a way that takes into account the sheer size of the regulatory state.

CONCLUSION

For the foregoing reasons, the judgment below should be reversed.

Respectfully submitted,

DANIEL P. ALBERS
FREDRIC P. ANDES
DAVID T. BALLARD
BARNES & THORNBURG LLP
One North Wacker Drive, Suite 4400
Chicago, IL 60606-2809
(312) 357-1313

Of Counsel:

HARRY NG
General Counsel
MICHAEL SEE
American Petroleum Institute
1220 L Street, N.W.
Washington, DC 20005-4070

Counsel for Amicus Curiae

AMICUS CURIAE BRIEF

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Supreme Court of the United States

ENTERGY CORPORATION,

Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

Respondents.

PSEG FOSSIL LLC, *et al.*,

Petitioners,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

UTILITY WATER GROUP,

Petitioner,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

ON WRITS OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF OF *AMICUS CURIAE* CALIFORNIA COUNCIL FOR ENVIRONMENTAL AND ECONOMIC BALANCE IN SUPPORT OF PETITIONERS

KEVIN M. FONG
Counsel of Record
MARGARET ROSEGAY
PILLSBURY WINTHROP SHAW PITTMAN LLP
50 Fremont Street
San Francisco, CA 94105
(415) 983-1270

Counsel for Amicus Curiae

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QUESTION PRESENTED

Whether Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency ("EPA") to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

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INTEREST OF *AMICUS CURIAE* [1]

The California Council for Environmental and Economic Balance ("CCEEB") is a non-partisan non-profit organization of business, labor and community leaders in California that seeks to achieve California's environmental goals in a manner consistent with a sound economy. CCEEB's membership includes the owners and operators of existing power generating facilities in California that comprise a significant percentage of the generating capacity within the state. Many of these plants are sited on the coastline or along other waterways and use ocean or surface waters for cooling. Water is drawn in through cooling water intake structures, passed through the plants' condensers to absorb heat, and then discharged back to the waterbody ("once-through" cooling). These cooling water intake structures are regulated under Section 316(b) of the Clean Water Act, which requires that the "location, design, construction, and capacity [of such structures] reflect the best technology available for minimizing adverse environmental impact," namely, the impingement and entrainment of fish and other aquatic organisms (hereafter, "BTA"). *See* 33 U.S.C. § 1326(b).

CCEEB — as well as the millions of Californians who depend on the electricity generated by these plants —

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the *amicus curiae*, its members, or its counsel made a monetary contribution to its preparation or submission. The parties have consented to the filing of this brief.

will be directly affected by the Court's decision in this case and thus have a strong interest in the question on which review was granted: whether Section 316(b) allows EPA to consider the costs of compliance relative to the environmental benefits to be gained in determining what constitutes "best technology available for minimizing adverse environmental impact" ("BTA") at existing power generating facilities that utilize "once-through" cooling. Any interpretation of Section 316(b) that would bar EPA from performing a cost-benefit analysis, either for purposes of identifying a national performance standard or for purposes of making site-specific BTA determinations at existing individual facilities, would have a dire impact on California's electricity grid and, indeed, on the economy of California as a whole.

In this brief, CCEEB seeks to illustrate the importance of upholding EPA's discretion to conduct cost-benefit analyses under Section 316(b), as fundamental to the development of sound environmental and energy policy. Absent the flexibility that is made possible through cost-benefit analysis, older plants will face severe pressure to shut down prematurely rather than incur the extraordinary costs to retrofit aging infrastructure that would be necessary to achieve compliance with a "one size fits all" standard. While some facility owners may be able to recover a portion of these costs over time by passing them through to their ratepayers, other facilities operate under different business models that do not allow this type of cost-shifting. In either case, enormous up-front capital investments would have to be made to modify the cooling systems of these older plants, despite the fact that the generating units themselves may be approaching

retirement. These site-specific financial and operational circumstances, as well as the adverse environmental and societal impacts of potential alternative cooling technologies, must be taken into consideration in any reasoned decision-making process. Cost-benefit analysis is the mechanism by which these fundamental policy decisions have historically been made, and is a critical tool that should continue to be available to EPA under a proper reading of Section 316(b).

ARGUMENT

I. EPA SHOULD HAVE DISCRETION TO USE COST-BENEFIT ANALYSIS.

The proper framework for determining whether EPA may rely upon cost-benefit analyses in making BTA determinations under Section 316(b) is set forth in *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837 (1984): If "the court determines Congress has not directly addressed the precise question at issue," then the question for the court is whether the agency's interpretation of the statute "is based on a permissible construction of the statute." *Id.* at 843 (footnote omitted). As discussed in Petitioners' briefs, there is nothing in the language of Section 316(b) which expressly prohibits EPA from conducting cost-benefit analyses in determining what constitutes BTA, either nationally or at an individual power generating facility or operating unit. Thus, the inquiry is whether EPA's interpretation of Section 316(b) — that it may conduct cost-benefit analyses under the statute — is permissible. *See* 69 Fed. Reg. 41,576, 41,603-41,604 (July 9, 2004) (hereafter, the "Phase II Rule").

Where an agency is charged with the administration of a statute, deference to its interpretation is particularly appropriate where the "decision as to the meaning or reach of a statute has involved reconciling conflicting policies." *Chevron*, 467 U.S. at 844 (quoting *United States v. Shimer*, 367 U.S. 374, 382 (1961)). That is precisely the case here, where the interests of the environment and the economy must both be considered. As in *Chevron*, EPA's interpretation of Section 316(b) "represents a reasonable accommodation of manifestly competing interests and is entitled to deference." *Id.* at 865.

Indeed, in adopting the Phase II Rule, EPA acknowledged the necessity for balancing environmental improvements to existing cooling water intake structures and individual operating units with the need to maintain reliable energy supplies for the country. Consistent with its administrative practice over the course of the past 30 years, EPA noted that "[t]he legislative history of section 316(b) indicates that the term 'best technology available' should be interpreted as 'best technology available commercially at an economically practicable cost.' This position reflects congressional concern that the application of best technology available should not impose an impracticable and unbearable economic burden." 69 Fed. Reg. 41,576, at 41,604 (citing 118 Cong. Rec. 33,762 (1972) (statement of Rep. Clausen)). In adopting the Phase II Rule, EPA determined that the costs of mandating a *specific* technology (closed-cycle, recirculating cooling systems) at existing facilities, as opposed to a requirement to achieve percentage reductions in impingement and entrainment through a variety of

allowable means (i.e., a performance standard), were not justified. *Id.* at 41,605. When it proposed the Phase II Rule in April 2002, EPA estimated that it would cost at least $3.5 billion per year, nationwide, for all existing facilities to install closed-cycle cooling,[2] and that approximately 20 additional plants might have to be built to compensate for the "energy penalty" associated with operating with cooling towers. *Id.*[3] EPA's cost estimate did not take into account the fact that a large number of existing plants would have to acquire additional property to accommodate cooling towers (assuming, in the first instance, that land could even be acquired and other land use obstacles overcome). In short, "the total capital cost investment and associated economic impact is simply too high at this time for EPA to be able to justify selecting cooling towers as a required technology for all existing Phase II facilities." *Id.* at 41,606.

Having rejected mandatory closed-cycle cooling on an economic basis, EPA considered the overall national costs of the different technologies that could be employed to achieve the required reductions in impingement and entrainment, and compared them to the environmental benefits, on a national level, that would be derived through implementation of these technologies. EPA determined that, overall, the costs

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[2] This is equivalent to approximately $4.2 billion in 2008 dollars using a conservative 3% annual adjustment for inflation.

[3] The period of time over which EPA assumed the Phase II Rule would be implemented is not specified. Based on information available to the industry, total retrofitting costs are expected to be at least an order of magnitude greater than EPA's annual estimate. *See infra* at p. 7.

were warranted relative to the environmental benefits. *Id.* at 41,603-41,604. However, EPA explicitly recognized that the same may not hold true for an individual facility where, due to site-specific considerations, the costs could outweigh the environmental benefits to be gained at a specific location. *Id.* To address this concern, EPA adopted a range of different compliance alternatives for meeting the performance standards "to provide a significant degree of flexibility to Phase II existing facilities, to ensure that the rule requirements are economically practicable, and to provide the ability for Phase II existing facilities to address unique site-specific factors." *Id.* at 41,591. EPA noted that the costs of retrofitting could be disproportionate to the benefits derived, and that "the validity and extent of such concerns often must be addressed on a case-by-case basis." *Id.* at 41,606.

In light of the "manifestly competing interests" (*Chevron*, 467 U.S. at 865), EPA's interpretation of Section 316(b) represents a reasonable accommodation that is entitled to deference. Thus, EPA should have discretion to use cost-benefit analysis in determining BTA for cooling water intake structures at existing power generating facilities and operating units.

II. PROHIBITING EPA FROM USING COST-BENEFIT ANALYSIS WOULD IMPOSE ENORMOUS COSTS AND CAUSE ECONOMIC DISRUPTION.

In adopting the Phase II Rule, EPA emphasized the need "to provide a significant degree of flexibility to Phase II existing facilities, to ensure that the rule requirements are economically practicable, and to provide the ability for Phase II existing facilities to address unique site-specific factors." 69 Fed. Reg. 41,576, at 41,591. EPA recognized the enormous costs that would be imposed by any requirement that existing facilities adopt closed-cycle cooling. *Id.* at 41,605. Indeed, one study estimates that the nationwide cost of retrofitting would be $40 billion. *See* UWAG Pet. For Writ of Cert., p. 37 (discussing UWAG Comments on Proposed § 316(b) Rule for Existing Facilities Comment 1.41, Aug. 7, 2002).

Moreover, as noted by Petitioner UWAG, large areas of the United States are operating with thin generation and transmission capacity margins. These concerns are particularly acute in California, where electricity supplies already are barely sufficient to meet demand, especially in Southern California, during periods of peak demand (summer months). California suffers from a lack of adequate generating and transmission capacity, and its complex permitting scheme and comprehensive environmental review requirements make the siting and construction of new generation a multi-year process under the best of circumstances. In addition, California is vulnerable to natural disasters, such as firestorms that often cause the shut-down of major transmission lines

for extended periods. These fires have ravaged California annually over the last several years, and the added demand that is placed on the grid as a result is significant. Broad areas of the state are at repeated risk of power shortages and blackouts during these periods.

Even more to the point, nearly all of California's 19 active coastal power plants — which account for nearly one-half of the state's generating capacity — use once-through cooling. This includes the two nuclear baseload facilities (Diablo Canyon Generating Station and San Onofre Generating Station) which are currently operating at greater than 99% capacity. In addition, eight of the plants are designated as Reliability-Must-Run ("RMR") facilities by the California Independent System Operator ("CAISO"). *See* California Energy Commission, *California Energy Commission Comments on the State Water Resources Control Board Scoping Document and Proposed Statewide Policy on Clean Water Act 316(b) Regulations* (Sept. 25, 2006), *available at* http://www.energy.ca.gov/siting/documents/2006-09-25_LETTER_TO_SWRCB.PDF (hereinafter "CEC Comments"), p. 2. RMR facilities are designated in areas where the local public utility's ability to import power is limited, and the utility must rely on local power plants to maintain electric service reliability. While the annual capacity factor for RMR facilities averages about 5%, the plants *must* be immediately available when they are dispatched by the CAISO. The power provided by these load-following facilities is vital to grid reliability and is essential to preventing power shortages and blackouts.

Many of California's existing coastal power generating facilities may be unable to comply with the large percentage reductions in impingement and entrainment that would be required by the Phase II Rule. As such, under the Phase II Rule as originally promulgated, these plants (many of which are operated by CCEEB's members) would have sought site-specific determinations of BTA, specifically, that their costs of complying with the performance standard would be significantly greater than the environmental benefits resulting therefrom. *See* 40 C.F.R. § 125.94(a)(5)(ii) (suspended July 9, 2007, 72 Fed. Reg. 37,107 (July 9, 2007)). Absent the ability to make site-specific demonstrations of BTA based on a cost-benefit test, these coastal plants might be required to shut down for extended periods in order to retrofit with alternative cooling technologies.[4] Even if these shutdowns were staggered to occur over a period of time (a scenario that is not contemplated by the Phase II Rule), the state could still suffer significant power shortages, even if some new replacement generation became available. Given the very high capacity factor for the state's two coastal baseload nuclear power plants, it is doubtful whether there is enough excess generation available to

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[4] This, of course, assumes, that permits could even be obtained from California regulatory authorities for the installation of cooling towers in the coastal zone. By their very nature, coastal cooling towers are large and ungainly, and have their own potentially significant adverse environmental and societal effects. In the face of an absolute requirement to comply with the national performance standard, these adverse affects would have to be disregarded. This result is both illogical and inconsistent with the broad Congressional directive in Section 316(b) "to minimize adverse environmental impact."

replace their near-zero greenhouse gas and criteria pollutant generating capacity that would be lost during a prolonged shut down. Even if such excess generation capacity could be found, all of the power would likely have to be provided by fossil fuel-fired plants that emit greenhouse gases and criteria pollutants, to the detriment of the state's ongoing efforts to combat global warming, in direct conflict with the California Global Warming Solutions Act of 2006 ("AB 32") (Cal. Health & Saf. Code, § 38500, *et seq.*) and the state's efforts to comply with ambient air quality standards for criteria pollutants as mandated by the federal Clean Air Act and the California Clean Air Act.[5]

Faced with these costs and burdens, many of the plants would simply shut down, especially if they are nearing the end of their useful lives in any event. These shutdowns would leave California with a significant shortfall in its power supplies and would pose a critical threat to the stability of California's electricity grid. These very concerns have been voiced by the California Energy Commission ("CEC"), the state agency charged with ensuring a reliable supply of electricity for California that is affordable and that minimizes harm to the environment. In its comments on the preliminary draft statewide policy on Section 316(b) being developed by the California State Water Resources Control Board,[6] the CEC underscored the current stress

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[5] AB 32 mandates significant reductions in current levels of greenhouse gas emissions by 2020.

[6] Both the final content of the preliminary draft policy (which is subject to formal rulemaking procedures), as well as the timing of its adoption, remain uncertain, and could well be affected by the Court's decision in this case.

on California's electricity grid and the paramount need to avoid untimely loss of generation by existing facilities. *See* CEC Comments, p. 1. The CEC noted that California's fleet of power plants is in the midst of a modernization trend, and that the most cost-effective time to modify or change cooling systems is when the plants are shut down for repowering. *Id.* at 2. However, not all of California's existing coastal power plants are expected to re-power. Some will retire at the end of their useful life, and it is these plants that are in particular danger of closing prematurely in the face of a requirement for an expensive retrofit. Since it is not currently known which plants will receive extended contracts in recognition of grid reliability requirements, a "one size fits all" retrofit requirement that does not allow for site-specific, cost-benefit considerations to be taken into account would certainly accelerate the shut-down of some facilities for economic or financial reasons. In the absence of adequate, operational replacement capacity, the state "cannot afford to have additional generating units retire" in response to retrofitting requirements. *Id.* at 3.

The CAISO, the entity responsible for the safe and uninterrupted flow of electricity to the grid, had also expressed concerns about how California will make it through the summer of 2008 without any serious disruption to the state's utility grid. *See* CAISO, *2008 Summer Loads and Resources, Operations Preparedness Assessment* (April 28, 2008), *available at* http://www.caiso.com/1fb7/1fb7855eed50ex.html. The CAISO's conclusion is that California has very little cushion or margin for any potential shutdowns of electricity supply, to the point where the loss of a single

unit's output could result in power outages. More pervasive shutdowns could result in a four-fold increase in the risk of emergency blackouts. *See* CAISO, *Old Thermal Generation, Phase I Report (2008-2012 Study Results)* (February 29, 2008), *available at* http://www.caiso.com/1f80/1f80a4a5568f0ex.html. The referenced studies by the CAISO represent the most recent in-depth analysis of overall grid reliability in California. These studies are ongoing and a more in-depth, facility-by-facility California grid reliability analysis is expected to be completed later in the year.

In California, a site-by-site (and indeed, unit-by-unit) cost-benefit analysis is essential.[7] Almost all of the 19 coastal power generation facilities in California have once-through cooling systems, and these facilities constitute nearly half of California's in-state power generating capacity. Each of these facilities must be evaluated on its own, using a cost-benefit analysis, to determine the best future course of action for that facility. Each of these facilities faces different physical, land use and financial constraints; their environmental settings differ; and they operate on any of several different business models. For example, the economic and financial circumstances facing a baseload nuclear plant operated by an investor-owned utility, a small "peaker" or load-following facility owned by an

[7] A single power plant may have multiple units with different physical and operating characteristics that may impact BTA decisions. What is appropriate or feasible for one unit may not be feasible for other units at the same plant.

independent operator, and a facility operated by a municipally-owned utility are each very different.[8] All of these variables necessarily affect the BTA determination.

Addressing such site-specific circumstances is vital in California, where a large proportion of the state's power generation capacity utilizes once-through cooling. California's precarious situation clearly illustrates the harm that would result if EPA were barred from conducting cost-benefit analyses in making BTA determinations under Section 316(b). In short, enormous costs would be imposed on individual plants, leading to a likely loss of generating capacity and widespread

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[8] Unlike investor- or municipally-owned public utilities that may have the ability to pass some or all of these costs through to their ratepayers (subject to approval by the Public Utilities Commission or other regulatory body), independent power generators operate on the basis of short-term contracts and, in the great majority of cases, are unable to pass costs through to their customers. Without a source of revenue to cover the investment needed for a re-powering or a cooling system retrofit, many independently owned plants may simply be retired. Even in the case of the utility-owned plants, significant costs may not be able to be passed through to the ratepayers. Moreover, a retrofitting project would not be undertaken at a utility-owned facility simply because some or all of the costs could be passed through. Instead, the project would need to be justified in the first instance on the basis of a detailed economic and engineering analysis. For many older plants, the investment required to accommodate a retrofit with alternative cooling technology cannot be so justified, irrespective of the ability to recover costs.

economic disruption resulting from an energy deficit, all without commensurate environmental benefit.[9]

As the agency charged with administration of the Clean Water Act, EPA's long-standing interpretation of Section 316(b), as most recently articulated in the Phase II Rule, should be upheld. Unlike health-based or water-quality based standards, technology-based standards such as Section 316(b) necessarily involve a weighing of competing interests. In adopting the national performance standards in the Phase II Rule, it was reasonable and appropriate for EPA to evaluate both the costs of new technology and the benefits that can be gained through its implementation. Furthermore, it

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[9] In conjunction with the periodic renewal of National Pollutant Discharge Elimination System ("NPDES") permits for California's coastal power plants under Section 402 of the Act (33 U.S.C. § 134[illegible]), the regional water quality control boards have required modifications and upgrades to the cooling water intake structures at many of these plants in order to implement Section 316(b). As a result, significant reductions in levels of impingement and entrainment have already been achieved, to the point where — in many cases — the continued operation of cooling water intake structures does not pose an unacceptable risk to aquatic populations. Exercising their "best professional judgment" under Section 402, the permit issuers have determined that the cost of replacing the once-through cooling water systems would be "wholly disproportionate" to the environmental benefits to be gained and that, accordingly, the existing cooling water intake structures represent BTA. At existing facilities that have already undergone modifications to achieve compliance with Section 316(b), the costs of achieving even greater reductions in impingement and entrainment, as necessary to meet a "one size fits all" standard, would be even more disproportionate to the benefits gained.

is inherently reasonable and appropriate to allow existing facilities (as distinct from new facilities) to demonstrate, on a case-by-case basis, that the costs of complying with the national performance standards are significantly greater than the environmental benefits to be gained. Were this not the case, individual facilities could be driven to expend enormous sums of money to install new cooling systems even in circumstances where the impingement and entrainment effects associated with the once-through system were demonstrably small or of nominal biological or ecological significance. Such a result should not be condoned.

The ability to allow site-specific exceptions to nationwide performance standards, based on a cost-benefit analysis that takes into account site-specific considerations, provides EPA, and state regulators with delegated authority to implement Section 316(b) as part of their NPDES programs, with the flexibility needed to make sound decisions, based on all relevant factors and to determine the best future course of action. Cost-benefit analysis is an important policy tool that accomplishes this result and that can be used wisely to avoid undesirable and unwarranted outcomes. Any interpretation of Section 316(b) that would bar EPA or authorized state regulatory agencies from comparing costs with benefits when making BTA determinations for existing facilities would interfere with an important and legitimate agency function and would most certainly have a dire impact on California and the nation.

CONCLUSION

For the foregoing reasons, the judgment of the Court of Appeals should be reversed.

Respectfully submitted,

KEVIN M. FONG
Counsel of Record
MARGARET ROSEGAY
PILLSBURY WINTHROP
SHAW PITTMAN LLP
50 Fremont St.
San Francisco, CA 94105
(415) 983-1270

Counsel for Amicus Curiae

AMICUS CURIAE BRIEF

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In The
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ENTERGY CORPORATION, *Petitioner*

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v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*

PSEG FOSSIL LLC, et al., *Petitioners*

v.

RIVERKEEPER, INC., *et al.*

UTILITY WATER ACT GROUP, *Petitioner*

v.

RIVERKEEPER, INC., *et al.*

On Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF FOR AMICI CURIAE CLEAN AIR TASK FORCE & CLEAN WATER ACTION – NEW ENGLAND, ET AL. AS AMICI CURIAE SUPPORTING RESPONDENTS RIVERKEEPER, *ET AL.*

ANN BREWSTER WEEKS
CLEAN AIR TASK FORCE
18 Tremont Street, Suite 530
Boston, MA 02108
(617) 624-0234

Counsel of Record for Amici Curiae Clean Air Task Force, Clean Water Action – New England, HealthLink Kentucky Resources Council, and Ohio Environmental Council

COCKLE LAW BRIEF PRINTING CO. (800) 225-6964
OR CALL COLLECT (402) 342-2831

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INTEREST OF THE AMICI CURIAE

Amici curiae Clean Air Task Force, Clean Water Action-New England, HealthLink, Kentucky Resources Council, and The Ohio Environmental Council (collectively, "Environmental Amici") are not-for-profit environmental and public health organizations working to improve environmental quality in their respective regions and throughout the United States. Specifically, Environmental Amici, on behalf of their thousands of members and contributors, have been advocates on energy-related environmental matters, with the goal of reducing the significant environmental, public health, and climate impacts of the fossil-fueled power plants that are subject to the regulations under review in this case. Environmental Amici provided legal and technical comments to the record on the Environmental Protection Agency ("EPA") rule at issue, and submitted an amicus brief in the case challenging that rule before the United States Court of Appeals for the Second Circuit. Amici therefore bring an informed perspective on the question whether and to what extent adverse air quality and climate impacts will necessarily result from standard setting under the plain text of section 316(b) of the Federal Water Pollution Control Act, 33 U.S.C. § 1326(b).[1]

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[1] No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No persons other than amici or their counsel made a monetary contribution to its preparation or submission. All of the parties to this suit have consented to the filing of this brief.

INTRODUCTION AND SUMMARY OF ARGUMENT

Environmental Amici offer this brief to the Court from our singular perspective as a group of organizations that work in the public interest on energy, climate change, air pollution and water pollution issues related to the nation's existing electric generating system. In particular, this brief rebuts the assertions made by Industry Petitioners Entergy Corp., *et al.* ("Entergy"), Utility Water Act Group ("UWAG"), and their supporting amici the Nuclear Energy Institute ("NEI") (collectively, "Industry"), that adverse air and climate change impacts will result as a matter of course if section 316(b) of the Federal Water Pollution Control Act, 33 U.S.C. § 1326(b) ("section 316(b)"), is read to prohibit EPA from using cost-benefit analysis in setting Best Technology Available ("BTA") performance standards for existing power plant cooling water intake structures.

As an initial matter, we agree with the brief filed by Respondents Riverkeeper, *et al.*, and incorporate the arguments it contains, particularly that the plain language of section 316(b) does not authorize EPA to set performance standards under section 316(b) based on cost-benefit analyses. Riverkeeper Br. at 22-53. Moreover, we agree that this understanding of the statute's language does not require EPA "to make BTA determinations on the broadest categorical basis conceivable . . . ignor[ing] any and all differences among facilities and their locations." *Id.* at 31 (refuting assertions made in UWAG Br. at 43-50; NEI Br. 22-25; Nebraska, *et al.* Amicus Br. 8-10).

Industry argues, however, that the plain language of section 316(b) should be disregarded, because they assert that its application will yield such significant adverse environmental results that Congress could not have meant it to mean what it says. Entergy Br. at 52 (citing *Logan v. U.S.*, ___ U.S. ___, 128 S.Ct. 475, 848 (2007)); UWAG Br. at 27-28. They allege that if section 316(b) is read, as it must be, to prohibit the use of cost-benefit analysis in standard setting, the result will be increased air and climate-forcing emissions caused by additional fuel use associated with more protective cooling water systems. Entergy Br. at 5-6, 49-51; UWAG Br. at 27-28; NEI Br. at 3-4, 21-22. But Industry's arguments do not present genuinely absurd results – indeed, they are based on false legal premises and inaccurate technical analyses, and they do not comport with real-world experience with retrofitting cooling water intake systems. As such, Industry has failed to provide sufficient justification for the Court to disregard the plain text of the statute. *See Public Citizen v. U.S. Dep't of Justice*, 491 U.S. 440, 470-472 (1989) (Kennedy, J., concurring in the judgment).

ARGUMENT

1. The Plain Language of Section 316(b) Does Not *Ipso Facto* Yield the Results Assumed by Industrial Petitioners and Their Amici.

Industry's contentions are based on the premise that if EPA implements the statute as it is written – without using cost-benefit analysis tools to select BTA – the plain meaning of the statute will *necessarily* cause EPA to issue rules on the broadest categorical basis conceivable, for example, requiring that all existing power plants must apply closed cycle or dry cooling technology.[2] Riverkeeper, *et al.* have amply demonstrated in their briefs that this is an entirely flawed assumption as a legal matter. Riverkeeper Br. at 26-33. For, "[s]ection 316(b) does not, after all, require EPA to order that a certain technology be used, but permits the Agency instead to establish performance standards that reflect the use of available technology." *Id.* at 30. Indeed, as found by the Second Circuit, the statute provides EPA authority to select the best technology[3] for "minimizing adverse

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[2] *See, e.g.*, NEI Br. at 13, n.17 (speculating that "[i]f the EPA is foreclosed from considering the costs of implementing proposed technologies, except in the limited respects permitted by the court of appeals, respondents will almost certainly contend that the agency must mandate adoption of closed-cycle cooling.").

[3] As an initial matter, EPA must select the "optimally best performing" technology as the basis for BTA, but then "must . . . ascertain whether the industry as a whole can reasonably bear the cost of the adoption of the technology, bearing in mind the

(Continued on following page)

environmental impact," considering air quality and energy efficiency concerns, and thereby avoiding the "parade of horribles" that animate the Industry briefs. *Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 100 n.12 (2d Cir. 2007); *see also Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 194-95 (2d Cir. 2004) (allowing EPA, in setting section 316(b) standards for new power plants, to consider the air pollution associated with projected energy efficiency losses).

2. The Plain Language of Section 316(b) Allows EPA To Consider Adverse Energy and Environmental Impacts in Setting BTA Standards.

Industry conflates two separate issues in its attempt to inject questions related to energy and adverse environmental impacts into the case before this Court. As explained above, these issues are relevant to the goal of establishing section 316(b) standards, that is, the minimization of adverse energy and environmental impacts from cooling water intake. Such questions, however, are not directly relevant to EPA's authority under section 316(b) concerning the use of cost-benefit analysis. *See* Br. of Amici Curiae Economists Frank Ackerman, *et al.*, *Entergy Corp. v. EPA*, U.S. Nos. 07-588, 07-589 and 07-597 (September 2008) at 25-26 (describing the

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aspirational and technology-forcing character of the [Clean Water Act]."). *Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 100 (2d Cir. 2007).

differences between a cost-benefit calculation on the one hand, and, on the other hand, crafting a regulation based on its fundamental goals and the application of a cost-effectiveness analysis to choose between technologies that meet those goals).

In fact, EPA did consider the energy penalty issues raised by Industry during the course of the Phase II cooling water rulemaking, and found them negligible. Specifically, in its description of the market impacts that could result if closed cycle cooling were established as BTA for power plants on sensitive waterbodies, EPA noted that capacity closures of 1.1 percent in the Northeast and 1.3 percent in the West "would represent an insignificant percentage of total baseline capacity in [those] regions." National Pollutant Discharge Elimination System – Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 67 Fed. Reg. 17,122, 17,186/1 (April 9, 2002). It is furthermore noteworthy that the Second Circuit has remanded the rule to the Agency for further explanation related to energy efficiency and production concerns raised below by the parties. *Riverkeeper,* 475 F.3d at 100 n.12.

3. Industry Petitioners' Parade of Environmental Horribles Is Discredited Because it is Based On Flawed EPA Modeling.

Furthermore, Industry's assertions that significant air pollution emissions increases (implicating

public health and global warming impacts) will assuredly follow *if* this Court effectuates the plain language of section 316(b)[4] are based on inaccurate technical assumptions made by the Agency in its rulemaking below.

Environmental Amici have previously brought these technical flaws to the attention of EPA, in the rulemaking record underlying this case, and to the Second Circuit Court of Appeals, in a brief as amici curiae. In that brief, and in the record before the Agency on the rulemaking in this case, Environmental Amici show that EPA's (now Industry's) assertions of a "permanent" energy penalty and associated incremental air quality and climate impacts are simply overstated, and in some instances wrong. Brief of Environmental Amici HealthLink, *et al.*,

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[4] Entergy argues that a plain reading of section 316(b) *necessarily* will result in the application of technologies that are "less effective at cooling and therefore reduce the efficiency and electric output of the facilities using them" – resulting in increased air pollutant emissions, causing additional public health and climate impacts. Entergy Br. at 5. Entergy raises the spectre of a "permanent 'energy penalty' [that] can be up to 5 percent or more of a facility's output, . . . negatively affect[ing] energy supply and electric system reliability. . . . [and]requiring greater consumption of fuels . . . which, in turn, generally results in increased air emissions of carbon dioxide and other pollutants." *Id.* at 5, 6 (citing, *inter alia*, 69 Fed. Reg. 41,576, 41,605 (July 9, 2004)); *see also* UWAG Br. at 55 (citing 69 Fed. Reg. at 41,605-06, and broadly asserting that "changes to the cooling system often create significant adverse side-effects, most notably energy penalties and increased air emissions.").

Surfrider Foundation v. U.S. EPA, No 04-6692-ag(L) (2d Cir. July 26, 2005) ("HealthLink Br.").

Environmental Amici and other citizen groups first pointed out in comments to EPA on its proposed rule that the Agency's energy penalty and related air emissions assumptions were overstated and based on a flawed computer modeling. 316bEFR.061.001 at 1927. Specifically, in developing its projections of the rule's impacts on electricity markets, the Agency relied on the IPM 2000 computer model of the domestic electric power market that simulates how power generators are likely to respond over time to various "user-specific constraints" such as new environmental regulations. 67 Fed. Reg. at 17,181/3.

Environmental Amici demonstrated that the Agency's projections based on IPM 2000 were unsound due to a critical flaw in the model, which significantly underestimated the amount of new generating capacity to be built in 2000-2013. 316bEFR.061.015 at 1946. Consequently, even the market impacts cited in the proposed rule, which EPA itself claimed were insignificant,[5] were inadvertently exaggerated by the Agency. As we pointed out to the Second Circuit, when properly "viewed in the context of the enormous investments being made in new power generation, it became evident that [even] a closed cycle cooling rule would not appreciably affect the reliable supply of energy in the United States."

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[5] 67 Fed. Reg. at 17,186/1.

HealthLink Br. at 6 (citing 316bEFR.061.008 at 1934, 316bEFR.061.015 at 1946).

EPA acknowledged the problems with its IPM modeling when it issued the final Phase II rule. 316bEFR.061.001 at 1927. However, the final EPA rule continued to reflect and rely on these incorrect assumptions and on the conclusions drawn from them about the extent of the energy penalty and associated environmental impacts. See National Pollutant Discharge Elimination System – Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,605-07 (July 9, 2007). Entergy, UWAG, and amici NEI now rely on precisely these same flawed recitations from the final rule as the fundamental basis for their assertions that air quality and climate impacts will be so severe that this Court should override the plain language of section 316(b). Entergy Br. at 6 (citing 69 Fed. Reg. at 41,605 for the proposition that the energy penalty identified by EPA will result in increased emissions of carbon dioxide and other air pollutants); UWAG Br. at 55 (same); NEI Br. at 22 (same). Industry's statements about the threat of increased air emissions and climate change effects, in other words, derive directly from the same flawed EPA "energy penalty" impacts presented in the preamble to EPA's final rule.

While any increase in air pollution, and any heightened threat of climate change is of course of significant concern to Environmental Amici and their members, the record below does not demonstrate that

Industry's dire predictions are warranted – and certainly does not show that they are so significant as to justify disregarding the plain text of section 316(b). In particular, even assuming *arguendo* that a plain reading of the statute would result in a closed-cycle cooling rule, the U.S. Department of Energy ("DOE") found that the "incremental air emissions" due to a rule requiring closed-cycle cooling retrofits, "are not large on a percentage basis (generally, less than one percent)." 316bEFR.010.103 at 261. Additionally the DOE noted that "widespread installation" of closed cycle cooling systems at coal-fired power plants "would likely not impact the ability of the electric generation sector to meet more stringent air emissions caps." *Id.* at 257.

Finally, some of the Industry arguments are simply speculative. For example, NEI posits that if EPA cannot rely on cost benefit analysis to set cooling water intake structure standards, the costs of installing retrofit cooling technologies *could* cause some nuclear facilities to shut down (or not), thereby *possibly* requiring increased utilization of fossil generation to meet electricity demand (or not), thereby *perhaps* yielding higher air pollutant emissions including carbon dioxide (or not). *See* NEI Br. at 14. But this argument by its very nature is non-conclusive. NEI does not assert that implementation of the Act, as written by Congress necessarily must or will yield this result.

4. Real-world Experience With Cooling Water Intake System Improvements Belies Industry's Dire Predictions.

In stark contrast to the disaster scenarios offered up by Industry before this Court, the decision to convert to newer, cleaner cooling water intake structure systems is often taken as part of a package of overall upgrades and pollution controls, such that the net result is a more efficient plant overall, using much less water and emitting far fewer air pollutants. For example, information available at Modernizing El Segundo's Power Generating System, http://www.elsegundorepowering.com (last visited October 1, 2008), describes the win-win-win situation at the El Segundo power plant in California. The owners and operators of that existing facility have decided to replace a once through cooling system with dry cooling as part of a repowering project, eliminating the use of Santa Monica Bay seawater as a coolant. As a result of that project, the overall efficiency of the plant will be improved, energy production is expected to increase by up to 560 megawatts, and overall air emissions from the facility will be significantly reduced, compared to the existing facility. *Id.*

Similarly, at the Bethlehem Energy Center, near Albany, New York, the decision by PSEG Power New York to replace an antiquated once-through cooling system with a hybrid closed cycle/dry cooling system came as part of a decision to replace an older existing plant with a new, more efficient, lower polluting plant with almost twice the capacity of the existing facility.

See Bethlehem Energy Center CCGT Power Plant, New York Power Technology, http://www.power-technology.com/projects/bethlehem/ (last visited October 1, 2008). At that facility, cooling water withdrawals from the Hudson River (formerly on the order of 500 million gallons per day) were reduced by over 98 percent, while energy generating capacity increased from 400 to 750 megawatts and overall air emissions were reduced by 95 percent. *Id.*

Far from the parade of horribles predicted by Industry petitioners and their amici, these case studies indicate that cooling water system upgrades – even dramatic changes to the most environmentally protective technologies – are not necessarily accompanied by energy capacity losses and air pollution increases.

CONCLUSION

The concerns raised by Industry do not "demonstrate the kind of absurd consequences that would justify departure from the plain language of the statute." *Public Citizen*, 491 U.S. at 470-472 (Kennedy, J. concurring) (noting that the absurd results doctrine should be applied only in the limited situation "where the result of applying the plain language would be, in a genuine sense absurd, *i.e.*, where it is quite impossible that Congress could have intended the result"). They are not as a legal matter the necessary consequences of implementing the Clean Water

Act as it is written, and they are based on flawed technical assumptions. Nor are industry's concerns supported by real-world experience with the application of newer, more effective power plant cooling water intake structures.

Environmental Amici therefore respectfully submit that this Court should find that there is no legal basis to disregard the plain language of section 316(b) of the Clean Water Act.

Respectfully submitted,

ANN BREWSTER WEEKS
CLEAN AIR TASK FORCE
18 Tremont Street, Suite 530
Boston, MA 02108
(617) 624-0234

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AMICUS CURIAE BRIEF

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On Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

AMICUS CURIAE BRIEF OF COMMERCIAL FISHERMAN OF AMERICA, ET AL. IN SUPPORT OF RESPONDENTS

ELIZABETH J. HUBERTZ*
MAXINE I. LIPELES
INTERDISCIPLINARY ENVIRONMENTAL CLINIC
WASHINGTON UNIVERSITY SCHOOL OF LAW
One Brookings Drive
St. Louis, Missouri 63130
(314) 935-8760
**Counsel of Record*

STEPHANIE TAI
UNIVERSITY OF WISCONSIN LAW SCHOOL
975 Bascom Mall
Madison, Wisconsin 53706
(608) 262-2240

COCKLE LAW BRIEF PRINTING CO. (800) 225-6964
OR CALL COLLECT (402) 342-2831

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Daniel Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996) 22

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INTERESTS OF *AMICI*

Amici Commercial Fishermen of America, Atlantic Offshore Lobstermen's Association, Gloucester Fishermen's Wives Association, Maryland Watermen's Association, Midcoast Fishermen's Association, Ocean State Fishermen's Association, Pacific Coast Federation of Fishermen's Associations, Rhode Island Commercial Fishermen's Association, Rhode Island Lobstermen's Association, and Rhode Island Shellfishermen's Association (collectively, "Commercial Fishing Organizations") are commercial fishing organizations concerned about the devastating impacts of once-through cooling water systems on fisheries.[1] *Amici* include ten commercial fishing organizations, one national in scope and the others regional along the East and West coasts. They represent people who earn their livelihoods from fishing, some on a full-time basis and others, because of weather and fishing restrictions, limited to part-time employment in the industry. Many of their members are single-boat family-run businesses; others are larger, commercial fleets. Appendix I contains a brief description of each *amicus* Commercial Fishing Organization.

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[1] All parties have consented to the filing of this brief, and the consent letters are on file with the Clerk in accordance with Supreme Court Rule 37.2(a). No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici*, their institutions, or their counsel made a monetary contribution to its preparation or submission.

Commercial fishing constitutes a significant sector of the U.S. economy. In 2007, commercial fishing contributed some $34.2 billion to the Gross National Product.[2] Commercial fishing is extraordinarily dangerous. It has consistently ranked as the most deadly occupation in the U.S.[3]

Commercial fishing depends fundamentally on the availability of fish. Once-through cooling water systems at existing power plants currently kill and maim vast quantities of commercially valuable fish, as well as eggs, larvae, and prey necessary for the rejuvenation and survival of the species. *Amici* Commercial Fishing Organizations have observed firsthand and suffered from the wholesale destruction of fish communities caused by once-through cooling systems, and have likewise seen the beneficial effects when power plants instead employ closed-cycle cooling systems. *Amici* Commercial Fishing Organizations are concerned that the use by the U.S. Environmental Protection Agency ("EPA") of cost-benefit analysis to develop the Phase II Rule at issue

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[2] U.S. Department of Commerce, National Oceanic and Atmospheric Administration, NOAA Economics, at http://www.economics.noaa.gov/?goal=ecosystems&file=users/business/fisheries (last visited October 1, 2008).

[3] U.S. Environmental Protection Agency, Regional Analysis Document for the Final Section 316(b) Phase II Existing Facilities Rule, EPA-821-R-02-003 (February 12, 2004), available at http://www.epa.gov/waterscience/316b/phase2/casestudy/final.htm (last visited October 2, 2008) ("Regional Analysis"), at A10-22.

in this case[4] inherently fails to protect the interests of commercial fishermen and the countless families and communities that depend on them for economic survival.

SUMMARY OF ARGUMENT

The Clean Water Act requires that the nation's waters be made safe for fish. The statute seeks to ensure that all waters provide for the "protection and propagation of fish, shellfish, and wildlife." 33 U.S.C. § 1251(a)(2). The livelihood of the nation's commercial fishing industry rests on the fulfillment of this goal.

EPA's Phase II Rule fails to achieve the fisheries protection required by section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b). Once-through cooling water systems, currently in use at most existing power plants, kill billions of fish each year. EPA's Phase II Rule is projected to save only 33 percent of the 1.5 billion commercial and recreational fish killed each year by existing power plants. Closed-cycle cooling systems, by contrast, could save up to 98 percent of these fish.

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[4] U.S. Environmental Protection Agency, National Pollutant Discharge Eliminate System – Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Facilities, 69 Fed. Reg. 41576 (July 9, 2004), in Petitioner Entergy's Appendix ("Pet. App.") at 122a ("Phase II Rule").

EPA unlawfully employed cost-benefit analysis to develop the Phase II Rule, and also authorized facilities to use site-specific cost-benefit analyses to determine how they might comply with the Rule. Cost-benefit analyses are incapable of valuing in dollar terms the benefits of fisheries protection. As EPA acknowledged, most of the fisheries benefits associated with improved cooling system technology cannot be monetized. There is very limited data available regarding fishery stocks. The cumulative impacts on fisheries of exposure to multiple cooling intake systems, pollution, overfishing, and other stressors are "largely unknown." EPA conceded that its cost-benefit analysis compared "a partial measure of benefits [to fisheries and the aquatic ecosystem] with a complete measure of costs [to power plants]." Phase II Rule, 69 Fed. Reg. 41576, 41666 (July 9, 2004) (Pet. App. 526a-527a.)[5]

The fact that it is so difficult, if not impossible, to assess and place dollar values on the benefits associated with protecting fisheries from once-through cooling underscores the wisdom of Congress's policy decision in 1972 to preclude EPA from using cost-benefit analyses in setting cooling water intake standards under section 316(b) of the Clean Water Act.

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[5] Citations to Pet. App. refer to the Appendix filed in No. 07-588.

ARGUMENT

I. ONCE-THROUGH COOLING WATER SYSTEMS POSE A SIGNIFICANT THREAT TO THE COMMERCIAL FISHING INDUSTRY.

A. Fisheries Protection Is A Core Goal Of The Clean Water Act.

Protection of fisheries is a central goal of the Clean Water Act. Congress declared in 1972 that, by 1983, the nation's waters should "provide[ ] for the protection and propagation of fish, shellfish, and wildlife . . . " 33 U.S.C. § 1251(a)(2). *See also PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 704 (1994). "One of the well-recognized aims of the Act is to ensure that the nation's waterways are 'fishable and swimmable.'" *Friends of the Earth, Inc. v. Gaston Copper Recycling Corp.*, 204 F.3d 149, 156 (4th Cir. 2000).

Commercial fishermen have a tangible stake in the Act's objective to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," 33 U.S.C. § 1251(a), so that they remain fishable. Indeed, commercial fishermen help the public to realize the benefits of the Act's fishable protections. Many wish to eat fish, both for their health and their enjoyment, but few have the skill, equipment, access, and time to locate, catch, and clean their own fish. Commercial fishermen collectively perform those services, but they cannot do so – and cannot maintain their livelihoods – without sustainable fish populations.

Once-through cooling systems at power plants pose a significant threat to numerous fish populations. As a result of once-through cooling and other factors, the commercial fishing industry is subject to numerous "overfishing" restrictions and catch limitations under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 *et seq.* Already struggling under such restrictions, commercial fishermen are substantially harmed by EPA's Phase II Rule because it fails meaningfully to protect fisheries from the devastating impacts of once-through cooling.

B. Once-Through Cooling Water Systems Cause Enormous Harm To Fisheries.

Petitioners and their *amici* suggest that the fact that once-through cooling systems kill and maim enormous quantities of fish and other aquatic life is of little overall significance, and in some ways even beneficial. See, e.g., Entergy Br. at 49-50 and UWAG Br. at 8-10. These claims are misleading at best, contrary to EPA's findings in support of the Phase II Rule, and contrary to the experience of commercial fishermen.

As acknowledged by EPA and highlighted by respondents and other *amici*, in particular National Wildlife Federation, once-through cooling systems cause devastating impacts to aquatic life. EPA estimates that once-through cooling systems at facilities covered by the Phase II Rule withdraw more than 214

billion gallons of water each day, killing more than 3.4 billion fish and shellfish each year by means of impingement and entrainment. Phase II Rule, 69 Fed. Reg. at 41586 (Pet. App. at 169a-170a). Once-through cooling systems not only kill fish and shellfish that could otherwise be caught and sold by commercial fishermen, but they also threaten the ability of aquatic communities to sustain themselves by destroying vast numbers of eggs and larvae.

This wholesale destruction of fish communities necessarily threatens the commercial fishing industry. Among the "multiple types of undesirable and unacceptable environmental impacts that may be associated with Phase II existing facilities," EPA listed "losses to populations including reductions of indigenous species populations, commercial fisheries stocks, and recreational fisheries[.]" *Ibid.* In addition, "cooling water systems 'may interfere with the maintenance or establishment of optimum yields of sport or commercial fish and shellfish, decrease populations of endangered organisms, and seriously disrupt sensitive ecosystems.'" *Cronin v. Browner*, 90 F.Supp.2d 364, 367 (S.D.N.Y. 2000) (internal citation omitted).

At best, once-through cooling systems substantially exacerbate the enormous strains on the commercial fishing industry. Most obviously, fewer fish available to catch and sell translates directly into reduced revenues for commercial fishermen. Accordingly, fewer fish means leaner times for fishermen. "People employed in the fishing subsector harvest fish

and shellfish from their natural habitat in fresh water and in tidal areas and the ocean, and depend for their livelihood on a naturally replenishing supply of fish, lobster, shellfish, or other edible marine life."[6] As a result of once-through cooling systems, pollution, and other threats to fish populations, fish stocks have become depleted and "overfishing" restrictions such as catch limits have been imposed. The combination of once-through cooling and catch limits places a tremendous burden on commercial fishing. In the North Atlantic region, for example, "the majority of the stocks requiring management are also subject to I&E [impingement and entrainment]." Regional Analysis at C2-3.

> . . . [I]t is undisputed that fishermen are struggling to sustain their livelihood despite strict fishery management restrictions which aim to rebuild fish populations. EPA shares the concerns expressed by expert fishery scientists that historical overfishing has increased the sensitivity of aquatic ecosystems to subsequent disturbance, making them more vulnerable to other stressors, including cooling water intake structures.

Phase II Rule, 69 Fed. Reg. at 41590 (Pet. App. at 188a).

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[6] Bureau of Labor Statistics, U.S. Department of Labor, *Career Guide to Industries, 2008-09 Edition*, Agriculture, Forestry, and Fishing (available at http://www.bls.gov/oco/cg/cgs001.htm) (visited September 27, 2008).

At worst, however, once-through cooling systems have driven the decline of commercial fisheries. One such example, which EPA noted in the Phase II Rule and with which Commercial Fishing *amici* are directly familiar, involves the Brayton Point Station power plant in Mount Hope Bay, Massachusetts. In this case, EPA documented both (1) stark evidence of the difference between once-through and closed-cycle cooling systems in terms of fisheries losses and (2) the inability of fisheries to recover, even when strict catch limits are in place, when confronted with a poorly-located once-through cooling system.

> EPA determined that, among other things, the facility's cooling water system had contributed to the collapse of the fishery and inhibited its recovery despite stricter commercial and recreational fishing limits and improved water quality due to sewage treatment upgrades. The facility currently withdraws nearly one billion gallons of water each day and the average annual losses of aquatic organisms due to impingement and entrainment are estimated in the trillions, including 251 million winter flounder, 375 million windowpane flounder, 3.5 billion tautog and 11.8 billion bay anchovy. *A dramatic change in the fish populations in Mount Hope Bay is apparent after 1984 with a decline by more than 87 percent, which coincides with a 45 percent increase in cooling water withdrawal from the bay due to the modification of Unit 4 from a closed-cycle recirculating system to a once-through cooling*

> *water system and a similar increase in the facility's thermal discharge.* The downward trend of finfish abundance in Mount Hope Bay is significantly greater than declines in adjacent Narragansett Bay that is not influenced by the operation of Brayton Point Station. *Despite fishing restrictions, fish stocks have not recovered.*

Phase II Rule, 69 Fed. Reg. at 41588 (Pet. App. at 179a-180a) (emphasis supplied).

The firsthand experience of *amicus* Ocean State Fishermen's Association in struggling to maintain their fishing livelihoods in the Mount Hope Bay area confirms EPA's findings about the role of the Brayton Point plant's once-through cooling system in devastating the flounder population in the Bay.

Although some may claim that the Brayton Point example is unusual, the paucity of reliable data undermines any such assertion. According to EPA, many of the studies addressing impingement and entrainment impacts of once-through cooling systems are characterized by "limited data that were collected as long as 25 years ago" and "serious study design limitations." Phase II Rule, Pet. App. at 181a-182a. In addition, only a small percentage of existing facilities with once-through cooling have any impingement and entrainment data, flawed or not. EPA reports that "only 150 out of 554 Phase II facilities have . . . ever performed an impingement and entrainment (I&E) study." U.S. Environmental Protection Agency, Economic and Benefits Analysis for the Final Section

316(b) Phase II Existing Facilities Rule, EPA-821-R-04-005 (available at http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm) (visited October 2, 2008) ("Economic and Benefits Analysis") at A2-1[7]

Because "[m]any CWIS have been constructed on sensitive aquatic systems with capacities and designs that cause damage to the waterbodies from which they withdraw water," *ibid.*, there is good reason to believe that the damage documented at the Brayton Point plant is occurring at numerous other sites.

C. The Phase II Rule Will Not Protect Commercial Fisheries From The Devastating Impacts Of Power Plants' Cooling Water Systems.

EPA's Phase II Rule will do precious little to mitigate these conditions. According to EPA, the Rule will reduce by only 33 percent the loss of commercial and recreational fish:

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[7] The Regional Analysis prepared by EPA in conjunction with the Phase II Rule indicated that California was the only region with more than 20% of the facilities reporting impingement and entrainment data. Regional Analysis at B2-20 (18 out of 20 facilities had such data).. For all other regions, fewer than one-fifth of the facilities had such data: North Atlantic – 4 out of 22; Mid-Atlantic – 6 out of 39; Gulf of Mexico – 4 out of 24; Great Lakes – 3 out of 56; and Inland Region – 3 out of 56. *Id.* at C2-15, D2-21, F2-14 (chart incorrectly labeled "California"), G2-13-15, and H2-11-12, respectively.

> Under current conditions, EPA estimates that over 1.5 billion fish (expressed as age 1 equivalents) of recreational and commercial species are lost annually due to impingement and entrainment at in-scope Phase II facilities. Under the final rule, more than 0.5 billion individuals of these commercially and recreationally sought fish species (age 1 equivalents) are estimated to survive and join the fishery each year.

Phase II Rule, 69 Fed. Reg. at 41669 (Pet. App. at 538a).[8]

In contrast, closed-cycle cooling systems could reduce these enormous losses by up to 98 percent. Phase II Rule, 69 Fed. Reg. at 41601 (Pet. App. at 239a-240a). In other words, whereas under the Phase II Rule 1.0 billion commercial and recreational fish will continue to be killed each year by existing power plants' cooling water systems, closed-cycle cooling could reduce the death toll to 0.03 billion – saving 0.97 billion more fish than under the Phase II Rule. EPA found that "[c]losed-cycle cooling systems . . . are the most effective means of protecting organisms from I&E [impingement and entrainment]." Economic and Benefits Analysis at A2-5. Some 14 percent of the

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[8] EPA estimates that a total of 3.4 billion fish and shellfish are currently being killed each year by impingement and entrainment at Phase II facilities. Phase II Rule, 69 Fed. Reg. at 41586 (Pet. App. at 171a-172a). EPA labels 1.5 billion of those fish and shellfish as commercial and recreational. *Id.*, 69 Fed. Reg. 41669 (Pet. App. at 538a).

facilities covered by the Phase II Rule already employ closed-cycle cooling. *Ibid.* However, the Phase II Rule does not necessarily require *any* of the remaining Phase II facilities to match the performance of closed-cycle cooling.[9]

II. CONGRESS PRECLUDED EPA FROM USING COST-BENEFIT ANALYSIS TO SET CWIS STANDARDS; COST-BENEFIT ANALYSIS CANNOT REASONABLY ACCOUNT FOR FISHERIES HARMS.

Petitioners frame the issue before this Court as one of balancing the environmental concerns of protecting fish against the economic concerns of industries required to implement cooling system controls. See, e.g., Federal Petitioners' Br. at 35-42 (providing an accounting of EPA's "costs and benefits" analysis but failing even to mention benefits to the commercial fishing industry); Entergy Br. at 45 (characterizing the relevant benefits in this case as "risks to individual fish").

Respondents and other *amici* explain why EPA's use of cost-benefit analysis to support the Phase II Rule is unlawful under the Clean Water Act, rendering petitioners' arguments irrelevant. Focusing on the

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[9] Use of technology whose performance is comparable to closed-cycle cooling is but one of five options from which facilities may choose in order to comply with EPA's Phase II Rule. Phase II Rule, 69 Fed. Reg. at 41590-91 (Pet. App. at 190a-196a).

aspects of EPA's cost-benefit analysis applicable to commercial fisheries – which are less incomplete and speculative than those aspects applicable to recreational fisheries and "non-use" ecological impacts – this brief highlights the flaws that preclude an accurate analysis of commercial fisheries impacts. Those flaws underscore the wisdom of Congress's policy decision to preclude EPA from using cost-benefit analysis in setting technology-based standards under Clean Water Act section 316(b).

EPA employed cost-benefit analysis in the Phase II Rule in two distinct contexts. First, EPA apparently used a cost-benefit analysis to develop the Phase II Rule itself. Second, one of the five compliance options established in the Phase II Rule offers facilities the opportunity to employ a site-specific cost-benefit analysis to develop their own cooling system requirements. 40 C.F.R. § 125.94(a)(5)(ii). Both uses of cost-benefit analysis undermine the Act's goal of fisheries protection because cost-benefit analysis cannot monetize the fisheries benefits side of the equation.

A. The Cost-Benefit Analysis On Which EPA Based The Phase II Rule Could Not Monetize All Commercial Fisheries Impacts.

Congress well appreciated in 1972, when enacting the Clean Water Act, that environmental benefits are difficult, if not impossible, to quantify and monetize.

See Amici Environmental Law Professors' Br. at 5-10. In its unlawful attempt to resurrect cost-benefit analysis in support of the Phase II Rule, EPA acknowledged the difficulties in monetizing the benefits of fisheries protection, put a dollar value on a miniscule fraction of the claimed benefits, and left the non-monetized benefits by the wayside. Phase II Rule, 69 Fed. Reg. at 41657-64 (Pet. App. 482a-515a).

EPA's benefits analysis offers separate estimates of monetized benefits to commercial fishing and recreational fishing, and attempts to quantify, but not to monetize, "non-use benefits" associated with commercial and recreational fishing as well as with ecological and other benefits. *Ibid.* EPA apparently considered benefits to commercial fishing the most amenable to monetizing because commercial fish are bought and sold in the market. *Id.*, 69 Fed. Reg. at 41657 (Pet. App. at 482a). It is particularly telling, then, that even EPA's calculations of the benefits to commercial fishing are riddled with data gaps and uncertainties.

First, EPA states that it was only able to monetize the Rule's benefits to 1.8 percent of the "age 1 equivalent aquatic organisms" that the Rule is expected to protect. *Id.*, 69 Fed. Reg. at 41660-61 (Pet. App. at 499a). "The Agency's direct use valuation does not account for the benefits from the remaining 98.2% of the age 1 equivalent aquatic organisms estimated to be protected nationally under today's rule." *Ibid.* While some of those non-monetized benefits pertain to recreational fishing

and non-use benefits, some of them pertain to commercial fishing. "Neither forage species nor the unlanded portion of recreational and commercial species have direct uses; therefore, they do not have direct use values." *Id.*, 69 Fed. Reg. at 41657 (Pet. App. at 484a). In other words, the benefits of protecting 98.2 percent of the purportedly-protected fish – an unspecified percentage of which are unharvested commercial species or food on which commercial species depend – are valued at $0.

Second, EPA acknowledges that it has limited information regarding the status of fishery stocks. The only data it has are for harvested species, and stock status even for harvested species is "often poorly known." Regional Analysis at A5-2. See also Phase II Rule, 69 Fed. Reg. at 41589-90 (Pet. App. at 186a-187a). "In addition to a lack of data, there are numerous issues and difficulties with defining the size and spatial extent of fish stocks. As a result, it is often unclear how I&E losses at particular cooling water intake structures can be related to specific stocks." Regional Analysis at A5-2.

Third, EPA's calculations admittedly do not reflect cumulative impacts of once-through cooling and other stressors on fish. For example, although migratory fish may be vulnerable to I&E impacts from multiple power plants' once-through cooling systems, and nearly one-fourth of the Phase II facilities are located on waterbodies with more than one Phase II facility, EPA was not able to assess these cumulative impacts.

> The potential cumulative effects of multiple intake structures located within a specific waterbody or along a coastal segment are difficult to quantify and are not typically assessed. . . . EPA is concerned that although the potential for aquatic species to be affected by cooling water withdrawals from multiple facility intakes is high, this type of cumulative impact is largely unknown and has not adequately been accounted for in evaluating impacts.

Phase II Rule, 69 Fed. Reg. at 41589 (Pet. App. at 183a).

In addition, although more than 99 percent of existing cooling systems facilities surveyed by EPA are within two miles of waterbodies with "impaired" water quality, EPA was unable to calculate the cumulative effects on fish of power plants' cooling systems and degraded water quality. *Ibid.* Nor could EPA calculate the extent to which cooling systems threaten the survival of already-depleted fishing stocks.

> Although a clear and detailed picture of the status of all our fishery resources does not exist, it is undisputed that fishermen are struggling to sustain their livelihood despite strict fishery management restrictions which aim to rebuild fish populations.
>
> EPA shares the concerns expressed by expert fishery scientists that historical overfishing has increased the sensitivity of aquatic ecosystems to subsequent disturbance, making them more vulnerable to

> other stressors, including cooling water intake structures.

Phase II Rule, 69 Fed. Reg. at 41590 (Pet. App. at 188a).[10]

Ultimately, EPA concedes that its cost-benefit analysis is seriously flawed:

> As a consequence of the challenges associated with estimating benefits, some benefits are described only qualitatively, because it was not feasible, by the time of publication of this final rule, to derive reliable quantitative estimates of the degree of impact and/or the monetary value of reducing those impacts at the national level
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> * * *

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[10] See also Regional Analysis at A10-3:

> In estimating the benefits of reducing I&E losses, it is important to understand how increased fish populations may affect stocks in different fisheries. Where stocks are thriving, a small increase in the number of individual fish affected by I&E may not be noticed, but where stocks are already depleted the marginal impact of a small increase may be much more important.
>
> Many fisheries in the United States tend to be heavily fished. In the mid-1900s, many U.S. fisheries were over-fished, some to the point of near collapse (NMFS, 1999b, 2001a; U.S. Bureau of Labor Statistics, 2002). The situation currently is showing some improvement slowly because of recent management efforts mandated by Magnuson-Stevens Act and other regulations. However, many of the current restrictions on fishing have not been in place long enough to have a dramatic impact on fisheries.

> EPA notes that these analyses are based on a comparison of a partial measure of benefits with a complete measure of costs; therefore, the results must be interpreted with caution.

Phase II Rule, 69 Fed. Reg. at 41657 and 41666 (Pet. App. at 485a and 526a-527a).

B. Site-Specific Cost-Benefit Analyses Authorized By The Phase II Rule Are Similarly Incapable Of Protecting Commercial Fisheries.

The Phase II Rule offers facilities the option of having their cooling water standards set by means of a site-specific cost-benefit analysis. 40 C.F.R. § 125.94(a)(5)(ii). Site-specific cost-benefit analyses are likely to suffer from all of the flaws that characterized EPA's cost-benefit analysis, highlighted above. A site-specific cost-benefit analysis is in no better position than was EPA to place a value on the 98.1 percent of aquatic organisms that include and support commercial fisheries but were excluded from EPA's Phase II cost-benefit analysis. A site-specific analysis is in no better position to overcome the paucity of baseline data than was EPA's Phase II analysis. And a site-specific cost-benefit analysis is even less well-suited than was EPA's nationwide analysis to take account of cumulative impacts, such as multiple cooling intake systems, overfishing, and other stressors on fish populations.

In addition, the migratory nature of many fish species highlights the prejudice to commercial fishing interests in the use of the site-specific cost-benefit option. Some commercially-valuable fish known as "anadromous," such as salmon, striped bass, and shad, spawn and raise their young in freshwater tidal rivers and live the rest of their lives in saltwater marine environments. Other commercial species known as "catadromous," such as eels, have the opposite lifecycle; they are born in the ocean and spend the rest of their lives in fresh water.[11] In addition, many commercial species, such as herring, anchovies, and mackerel, move in unpredictable patterns and can travel significant distances throughout their lives. Just as EPA's Phase II cost-benefit analysis did not even attempt to monetize the fisheries benefits of technology options in light of these life-cycle and migratory considerations, site-specific cost-benefit analyses will almost certainly exclude or undervalue them.

Such pervasive and insurmountable limitations in fully assessing and placing a dollar value on the benefits to fisheries of control options on a national level underscore the prejudice to commercial fisheries in employing even more limited, site-specific cost-benefit analysis. As the Rule states, "If the Director

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[11] See National Oceanic and Atmospheric Administration, "What Are Diadromous Fish?", available at http://www.nmfs.noaa.gov/habitat/habitatprotection/anadfish/indexa.htm (visited September 29, 2008).

determines that the data specific to your facility demonstrate that the costs of compliance under [earlier listed compliance alternatives] would be significantly greater than the benefits of complying with the applicable performance standards at your facility, the Director must make a site-specific determination of the best technology available for minimizing adverse environmental impact." 40 C.F.R. § 125.94(a)(5)(ii). The language of site-specificity for the cost-benefit analysis suggests that the focus of the Director's inquiry is to be on localized costs and benefits, which inherently undervalues fisheries benefits because of the interdependence between local fish stocks and conditions at other locations critical to fish survival. The multiple threats to fisheries and the other aquatic organisms on which they depend, at multiple locations, cannot be monetized, as EPA has determined, and will not even be valued in a site-specific context.[12]

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[12] As Orrin H. Pilkey and Linda Pilkey-Jarvis observe in the context of overfishing, mathematical modeling is more difficult in the context of fisheries than many other contexts. Orrin H. Pilky & Linda Pilkey-Jarvis, "Chapter 1: Mathematical Fishing," in USELESS ARITHMETIC: WHY ENVIRONMENTAL SCIENTISTS CAN'T PREDICT THE FUTURE, Columbia Univ. Press (2007) at 1-21. Contributing factors include "the complex interaction of huge number of parameters [which make] mathematical modeling on a scale of predictive accuracy that would be useful to fishers a virtual impossibility," id. at 10, and the "damaging simplifying assumption[s] put into a mathematical model in order to bridge a gap in understanding of the system being modeled." *Id.* at 12.

The problem for the Commercial Fishing Organizations is one of structural mismatch. See Daniel Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 587 (1996). The economic benefit that would accrue to the Commercial Fishing Organizations from a facility implementing the closed-cycle cooling technology would fall outside the boundaries described in the site-specific cost-benefit analysis. "In this case, because the regulator ignores the potential welfare gains of the extrajurisdictional beneficiaries, too little of the public good is provided." *Ibid.*; see also Richard O. Zerbe, *Optimal Environmental Jurisdictions*, 4 ECOLOGY L.Q. 193, 245 (1974) (identifying the need for larger-scale environmental regulation "where there is undue political influence at local levels, where there is sufficient interjurisdictional pollution, and where technological considerations give substantially greater efficiency to larger jurisdictions in either providing technical information or in carrying out control responsibilities").

Indeed, past studies of federal agencies' use of cost-benefit analyses support the concern that the Phase II Rule slights the cumulative impacts of multiple cooling water systems, numerous threats to fish at different life-cycle stages, and threats to vital food sources – all of which collectively threaten the sustainable fish populations necessary for commercial fishing to thrive. As the Presidential/Congressional Commission on Risk Assessment and Risk Management observed in 1997, federal agencies have a history of failure in identifying incremental but

cumulatively significant impacts.[13] This leads to the phenomenon that economist Alfred Kahn deemed the "tyranny of small decisions,"[14] where individual decisions that may not by themselves be considered detrimental will nonetheless cumulatively generate costly impacts. Such is the danger in both the general fisheries context[15] as well as other environmental contexts.[16] The Phase II Rule presents that very danger; it allows facilities to develop cooling system standards based solely on site-specific cost-benefit analyses, thereby rendering stakeholders with more regional economic concerns, such as commercial fishing interests, subject to this tyranny.

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[13] Presidential/Congressional Commission on Risk Assessment and Risk Management, Framework for Environmental Health Risk Management, at 9-14 (1997) (available at http://www.enotes.com/public-health-encyclopedia/risk-assessment-risk-management) (visited October 1, 2008).

[14] Alfred E. Kahn, *The Tyranny of Small Decisions: Market Failures, Imperfections, and the Limits of Economics*, 19 KYKLOS: INT'L REV. SOC. SCI. 23 (1966).

[15] See Robert C. Lothrop, *The Misplaced Role of Cost-Benefit Analysis in Columbia Basin Fishery Mitigation*, 16 ENVTL. L. 517, 534 n.61 (1986) (citing several studies demonstrating that fisheries values are underestimated when only a small portion of the fisheries supply is to be affected by any one development and cumulative impacts are ignored.")

[16] James C. Buresch, *State and Federal Land Use Regulation: An Application to Groundwater and Nonpoint Source Pollution Control*, 95 YALE L.J. 1433, 1448-49 (1986) (noting that a potential hazardous waste location might fail localized cost-benefit analysis, but still be the optimal site regionally).

In sum, the inability to monetize the benefits of fisheries protection in both the EPA's national approach to cost-benefit analysis in support of the Phase II Rule, and in the site-specific analyses authorized by the Rule, underscores the wisdom of Congress's policy choice to preclude EPA from using cost-benefit analyses to set technology-based standards under section 316(b) of the Clean Water Act.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted,

ELIZABETH J. HUBERTZ*
MAXINE I. LIPELES
INTERDISCIPLINARY
ENVIRONMENTAL CLINIC
WASHINGTON UNIVERSITY
SCHOOL OF LAW
One Brookings Drive
St. Louis, Missouri 63130
(314) 935-8760
**Counsel of Record*

STEPHANIE TAI
UNIVERSITY OF WISCONSIN
LAW SCHOOL
975 Bascom Mall
Madison, Wisconsin 53706
(608) 262-2240

October, 2008

APPENDIX I: IDENTIFICATION OF *AMICI* COMMERCIAL FISHING ORGANIZATIONS

Following is a brief description of *amici* Commercial Fishing Organizations.

Commercial Fishermen of America

The Commercial Fishermen of America ("CFA") is an umbrella non-profit organization that supports the nation's fishing men and women and promotes the health of the oceans in which they work. CFA members collaborate across all fishing regions of the United States by sharing ideas, finding jobs, and encouraging local regulations that protect and promote fish populations so that the time-honored profession of fishing remains alive. The CFA's mission is "to promote the common interest of the fishing industry, provide a forum to foster professional collaboration among fishermen, and educate Americans about the profession of commercial fishing." CFA is based in San Francisco, California. See also http://www.cfafish.org/about.html (last visited September 29, 2008).

Atlantic Offshore Lobstermen's Association

Established in 1970, the Atlantic Offshore Lobstermen's Association ("AOLA") (known until 1992 as the Atlantic Offshore Fishermen's Association) is a non-profit organization representing the commercial offshore lobster industry. AOLA is the sole voice of the offshore lobster fleet from New Hampshire to New

Jersey. AOLA addresses state and federal regulations and environmental concerns to preserve the long-term sustainability of the lobster resource and the lobster industry. AOLA works with scientists, managers, and academics to rebuild and protect the lobster resource and maintain the communities and shore-based infrastructure crucial to the survival of the commercial fishing industry. AOLA is based in Bedford, New Hampshire. See also http://offshorelobster.org/main/about (last visited September 29, 2008).

Gloucester Fishermen's Wives Association

The Gloucester Fishermen's Wives Association ("GFWA") is a non-profit organization that has been promoting the New England fishing industry, helping to preserve the Atlantic Ocean as a food supply for the world, and assisting active and retired fishermen and their families to live better lives since 1969. The goal of the organization is to help promote a healthy environment and a just economy that allows local and family-owned fishing enterprises to survive. GFWA has helped to organize fishermen's wives organizations in Alaska, Cape Cod, and England. GFWA is based in Gloucester, Massachusetts. See also http://www.gfwa.org/aboutUs/about.html (last visited September 29, 2008).

Maryland Watermen's Association

The Maryland Watermen's Association ("MWA") is a non-profit umbrella organization supporting

fishermen, crabbers, clammers, and others who benefit from the fisheries of Maryland's Chesapeake Bay. MWA consists of over 6000 members throughout the Chesapeake Bay area who fish striped bass, catfish, eels, oysters, white and yellow perch, and other fish. MWA is based in Annapolis, Maryland. See also http://www.marylandwatermen.com (lasted visited September 29, 2008).

Midcoast Fishermen's Association

Established in 2006, the Midcoast Fishermen's Association ("MFA") is a non-profit advocacy group for approximately 22 "Down East" Maine fishermen and their 11 boats. MFA works to restore groundfish fisheries and sustain fishing communities along Maine's coast for future generations. Because fishing for a variety of seafood, including lobster, shrimp, scallops, and fish, is the main source of income for many of Maine's residents, the MFA is based on a strong conservation ethic to ensure the livelihoods of future Maine fishermen. The MFA works with the Midcoast Fishermen's Cooperative (established in 2007 by Maine's groundfishermen) to establish a sustainable link between fishermen and the people who enjoy eating fresh seafood. MFA is based in Port Clyde, Maine. See also http://www.midcoastfishermen.org (last visited September 29, 2008).

Ocean State Fishermen's Association

Established in 1983, the Ocean State Fishermen's Association ("OSFA") has approximately 60 members from nearly all fisheries across Rhode Island, including lobster, finfish, shellfish, seiners, and aquaculture fisheries. OSFA members have personally observed a substantial decline in the winter flounder population in the Narragansett Bay as a result of the Brayton Point power plant. OSFA is based in Barrington, Rhode Island.

Pacific Coast Federation of Fishermen's Associations

For nearly 30 years, the Pacific Coast Federation of Fishermen's Associations ("PCFFA") has been the largest and most politically active trade association of commercial fishermen on the West Coast. A federation of many different port and fishermen's marketing associations, PCFFA includes member organizations along the West Coast from Alaska to San Diego, California. PCFFA works to assure the long-term survival of commercial fishing as a productive livelihood and way of life. PCFFA strives to embody the working family fisherman – the working men and women operating their vessels to bring to America's table the ocean's bounty of fresh wild salmon, dungeness and rock crab, squid, herring, swordfish, shark, blackcod, rockfish, albacore, sea cucumber, California halibut and flounder, urchin and abalone. PCFFA is based in San Francisco, California and Eugene,

Oregon. See also http://www.pcffa.org (last visited September 29, 2008).

Rhode Island Commercial Fishermen's Association

Founded in 1999, the Rhode Island Commercial Fishermen's Association ("RICFA") is a non-profit organization of working, commercial fishermen and family-owned fishing businesses. RICFA is works to promote the interests of the Rhode Island commercial fishing industry. RICFA members harvest a wide range of fish species, including cod, haddock, winter flounder, scup, squid, butterfish, mackeral, whiting, lobster, and sea scallops. RICFA supports the restoration and preservation of essential fish habitats and ecosystems in coastal New England as the foundation for ensuring the sustainable fisheries upon which its members depend. RICFA is based in Wakefield, Rhode Island.

Rhode Island Lobstermen's Association

Established in the 1970s, the Rhode Island Lobstermen's Association ("RILA") consists of approximately 80 members involved in all stages of lobster harvesting and manufacture in the "inshore" area within approximately 40 miles of shore. RILA has undertaken several programs to try to rebuild this lobster fishery to sustainable levels, including increasing the minimum size of lobsters that are harvested and dramatically reducing the number of

traps in the area. RILA is concerned that these and similar measures will be ineffective if CWIS continue destroying lobster larvae before they have a chance to recruit into the fishery. RILA is based in Wakefield, Rhode Island. See also http://www.rilobstermen.com (last visited September 29, 2008).

Rhode Island Shellfishermen's Association

The Rhode Island Shellfishermen's Association ("RISA") was established in 1980 and currently consists of approximately 100 members who harvest shellfish. RISA promotes water quality protection as a means of preserving the shellfish populations that support RISA members' financial well-being and livelihoods. All RISA members own and operate their own boats. RISA is based in Coventry, Rhode Island.

AMICUS CURIAE BRIEF

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In The
Supreme Court of the United States

ENTERGY CORP., *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Writs Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF OF ECONOMISTS FRANK ACKERMAN, NATHAN SIVERS BOYCE, PETER DORMAN, EBAN GOODSTEIN, RICHARD B. HOWARTH, PETER B. MEYER, JULIE A. NELSON, RICHARD B. NORGAARD, THOMAS MICHAEL POWER, KRISTEN SHEERAN, BENJAMIN K. SOVACOOL AND LYUBA ZARSKY AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

PROF. DAVID M. DRIESEN
Counsel of Record
SYRACUSE UNIVERSITY
COLLEGE OF LAW
E.I. White Hall
Syracuse, NY 13244
(315) 443-4218

PROF. DOUGLAS A. KYSAR
YALE LAW SCHOOL
127 Wall Street
New Haven, CT 06511
(203) 436-8970

October 6, 2008

COCKLE LAW BRIEF PRINTING CO. (800) 225-6964
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INTEREST OF THE *AMICI CURIAE*

Amici are professors and scholars who teach and write on economic theory and method, particularly with respect to natural resources and the environment. *Amici* have an interest in seeing that the Court is informed on the appropriate use of economic analysis in the implementation of § 316(b) of the Federal Water Pollution Control Act, 33 U.S.C. § 1326(b), commonly referred to as the Clean Water Act (CWA).

The end of this brief summarizes the *amici*'s qualifications and affiliations. *Amici* file this brief solely as individuals and not on behalf of the institutions with which they are affiliated.[1]

INTRODUCTION

This brief discusses the roles of various forms of economic analysis. Cost-benefit analysis (CBA) aims to identify allocatively efficient actions. Economists, however, have developed other forms of analysis for other purposes. Administrative agencies concerned about technology's economic availability have

[1] The parties have consented to the filing of this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici*, their institutions, or their counsel made a monetary contribution to its preparation or submission.

employed economic models that compare costs, not to benefits, but to regulated firm's financial capabilities to predict whether regulated firms can afford the best technology. This brief discusses the relationship of financial, cost-benefit, and cost effectiveness analysis to EPA's task as an agent of the elected legislature carrying out the instructions issued in § 316(b) of the CWA, concerning the regulation of cooling water intake. *See E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 138 (1976) (describing the question before the Court as "what Congress intended for *these* regulations," not "what a court thinks . . . generally appropriate to the regulatory process") [emphasis in original].

STATEMENT OF THE CASE

Electricity generating plants often withdraw water from rivers, lakes, and other waterways in order to manage excess heat generated during their production processes. EPA estimates that cooling water intake kills over 3.4 billion fish and shellfish (expressed as "age 1 equivalents") by either trapping organisms against components of the cooling water intake structure or drawing them into the cooling water system itself. Pet.App.170a-172a (69 Fed. Reg. at 41,586).[2] These two mortality threats, referred to

[2] Citations to Pet.App. refer to the appendix filed in No. 07-588.

as "impingement" and "entrainment," affect not only the various fish and shellfish species for which EPA has been able to generate quantitative estimates, but also certain threatened and endangered species, such as sea turtles, Chinook salmon, and steelhead, as well as immeasurable quantities of phytoplankton and zooplankton that lie at the base of aquatic food chains. Moreover, impingement and entrainment are only the most obvious and measurable adverse effects of cooling water intake on aquatic ecosystems.

Cognizant of these kinds of informational difficulties, Congress in § 316(b) mandated that "the location, design, construction, and capacity of cooling water intake structures [must] reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). In 1995, EPA agreed to a consent decree that required the agency to establish cooling water intake rules in multiple phases. *See Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 181 (2d Cir. 2004) (*Riverkeeper I*); *Riverkeeper, Inc. v. EPA*, 475 F.3d 83, 90 (2d Cir. 2007) (*Riverkeeper II*).

Phase I, involving new facilities, generally required facilities to achieve environmental performance standards based on what is known as "closed-cycle cooling technology," a process in which cooling water is recycled and only periodically replenished from neighboring waterways, rather than continuously withdrawn and discharged. Although environmentalists had argued on behalf of a more stringent "dry cooling technology," the Second Circuit

accepted EPA's conclusion that the expense of this technology rendered it not reasonably available to industry. *See Riverkeeper I*, 358 F.3d at 195-96; *Riverkeeper II*, 475 F.3d at 99 n.11.

Phase II involved large *existing* power plants. EPA's final regulations for this phase set forth a complicated array of compliance options that were built around a set of impingement and entrainment performance standards. According to EPA's own analysis, the Phase II rules allowed many facilities to avoid water intake reductions altogether. *See* EPA, Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule, EPA-821-R-04-005, February 2004, at D1-1 (Final Rule EBA).[3] Even where the rules required reductions, they formally mandated no more than 80 and 60 percent reductions, respectively, in impingement and entrainment. *See* Pet.App.189a-190a (69 Fed. Reg. at 41,590); *Riverkeeper II*, 475 F.3d at 105-08. EPA identified no single technology as the best available technology and offered no specific rationale for these numbers. *See Riverkeeper II*, 475 F.3d at 106.

Notably, EPA declined to use closed-cycle cooling technology as the benchmark against which other proposed protection measures might be evaluated. Despite acknowledging that impingement and

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[3] This document is available at http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm (last visited September 29, 2008).

entrainment provide the "primary and distinct types of harmful impacts associated with the use of cooling water intake structures," Pet.App.226a (69 Fed. Reg. at 41,598), and that "closed-cycle, recirculating cooling towers ... can reduce mortality from impingement by up to 98 percent and entrainment by up to 98 percent," Pet.App.239a-240a (69 Fed. Reg. at 41,601), EPA nevertheless adopted weaker standards.

The agency did so because it considered the cost of technologies in relation to the reductions in impingement mortality and entrainment achieved. Pet.App.250a (69 Fed. Reg. at 41,603). This efficiency-oriented approach had a significant effect on regulatory stringency: EPA estimated that 125 facilities would adopt no impingement and entrainment controls at all under the Phase II rules. *See* Final Rule EBA, *supra*, at D1-1. Moreover, rather than up to 98 percent reduction in impingement and entrainment, as attained by closed-cycle cooling technology, the agency estimated that most facilities would only achieve between 30.9-59.0 percent reduction in impingement and between 16.4-47.9 percent reduction in entrainment. *Id.* at C3-2.

The Second Circuit Court of Appeals remanded the Phase II regulations almost in their entirety. The basic defect of the rules, in the panel's view, was EPA's apparent decision to use CBA to identify the performance standard that could be attained by "the best technology available for minimizing adverse impact." According to the Second Circuit, such best availability technology (BAT) requirements

necessitate a different implementation approach: Because "Congress itself [already has] defined the basic relationship between costs and benefits," EPA's responsibility is simply to identify the most environmentally protective technology available at a cost that can be "reasonably borne" by the regulated industry. *Riverkeeper II*, 475 F.3d at 99 (quoting *American Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 509 (1981)).

On April 14, 2008, this Court granted certiorari to determine "whether Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the [EPA] to compare costs with benefits in determining the 'best technology available for minimizing adverse environmental impact' at cooling water intake structures." *See PSEG Fossil LLC v. Riverkeeper, Inc.*, 128 S. Ct. 1867, 1868 (2008).

SUMMARY OF ARGUMENT

Section 316(b) does not authorize CBA because the ratio of costs to benefits has no relevance to a decision about what constitutes the "best technology available for minimizing adverse environmental impacts." 33 U.S.C. § 1326(b). Determination of which technology *best* minimizes negative environmental impacts requires a comparative engineering evaluation of competing technologies' capacities to reduce environmental impacts. *See Train*, 430 U.S. at 131 (describing statutory provisions governing

technology-based water pollution rules as requiring an assessment of available technology's "effectiveness"); *Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 475-76 (2004) (discussing EPA's use of comparative "top-down" analysis to determine the "best available control technology" for air pollution). Under § 316(b), this engineering analysis focuses primarily on identifying technologies that minimize water intake that disrupt ecology and kill fish. Neither compliance cost nor its relationship to benefits is relevant to identification of the technology minimizing environmental impact.

Consideration of a technology's economic availability requires an economic analysis that compares compliance costs to the financial resources of regulated firms, rather than comparing these costs to environmental benefits. To the extent that a technology proves so costly that an industry cannot afford to purchase it, it might be considered unavailable. *See EPA v. National Crushed Stone Ass'n*, 449 U.S. 64, 74 (1980) (describing maximizing technology's use "within" an owner's "economic capability" as a site-specific application of the best available technology concept). The dollar value of water quality benefits, however, does not bear on whether a technology is available, as a technology's economic availability is solely a function of the relationship between costs and regulated firms' finances.

Economic analysis should serve the decisionmakers' legally appropriate goals. CBA

focuses on decisions about whether an environmental program is economically desirable in the abstract, a task that Congress often reserves for its own determination. *See generally* David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 Ecology L. Q. 545, 605-13 (1997) (discussing CBA's compatibility with a general legislative power). Since the elected legislature already has concluded that clean water is worth the necessary costs, it may rationally have assigned EPA the more limited role of deciding which available technologies maximize environmental protection. *Cf. Alaska*, 540 U.S. at 485 n.12 (discussing similar Clean Air Act provisions); David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 B.C. Envtl. Aff. L. Rev. 1, 19-21 (2005) (*Feasibility Principle*) (discussing similar provisions).

Elected representatives chose a BAT approach in order to maximize ecological restoration subject only to a technological availability constraint. The availability constraint addresses distributional concerns about plant shutdowns leading to unemployment, not concerns about net benefits. While CBA in principle supports efforts to identify allocatively efficient pollution levels, financial models provide appropriate tools for predicting whether pollution control costs might lead to plant shutdowns, instead of the employment increases that pollution control expenditures often produce. *Cf.* Eban

Goodstein, *The Trade-Off Myth: Fact and Fiction About Jobs and the Environment* 20 (1999) (associating environmental regulation with a small net increase in employment); Richard Morgenstern et al., *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. Envtl. Econ. & Mgmt. 412, 413-14 (2002) (finding environmental regulation likely increased employment modestly in the plastics, petroleum, steel, and pulp and paper industries).

Elected representatives may choose a BAT construct over CBA because of concerns about the feasibility of correlating costs and benefits in the water pollution context. CBA requires correlation of monetized marginal water quality benefits with the marginal cost of technologies. Because any technology's effect on environmental quality varies with the quality of each relevant water body, water pollution control technology always yields important water quality benefits that cannot be quantified and vast uncertainties about those that can be. A BAT approach may be desirable precisely because it avoids the need to link environmental protection expenditures to marginal water quality benefits, as CBA demands.

ARGUMENT

I. COST-BENEFIT ANALYSIS IS A WELFARE ECONOMIC DECISION PROCEDURE

To understand why CBA has proven controversial in the environmental, health, and safety context – and to perceive why Congress might have eschewed EPA's use of it in § 316(b) – it is necessary to know more about CBA than its surface resemblance to "common sense" or "basic rationality."[4]

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[4] *See, e.g.*, Brief for the Federal Parties ("Federal Brief"), at 13 ("In everyday life, people routinely weight costs against benefits in deciding whether to do something."); Brief of Petitioner Utility Water Act Group ("UWAG Br."), at 28 (calling "irrational" any interpretation of § 316(b) that would prevent "translating . . . costs and benefits into economic terms for comparison"); UWAG Brief at 57 ("In the broadest sense, cost-benefit balancing is a fundamental tool of logical decisionmaking."); Brief of Petitioners Entergy Corp., PSEG Fossil LLC, and PSEG Nuclear, at 29 ("At a basic level, what respondents and the Second Circuit denigrate as 'cost-benefit analysis' is nothing more than common sense – the imperative of basic rationality that actions do more good than harm."); Brief of *Amici Curiae* The AEI Center for Regulatory and Market Studies and 33 Individual Economists in Support of Petitioners, at 5 ("[A]s a general principle, regulators cannot make rational decisions unless they are allowed to compare costs and benefits. . . .").

A. Cost-Benefit Analysis Aims to Identify Allocatively Efficient Regulation Based on Monetized Estimates of Policy Impacts on Human Well-Being

CBA serves as a tool for identifying allocatively efficient regulation, defined as regulation that generates costs equaling benefits at the margin. *See* Tom Tietenberg, *Environmental Economics and Policy* 25 (4th ed. 2004); 1 *Handbook of Environmental Economics: Environmental Degradation and Institutional Responses* 253-54 (Karl-Goran Maler & Jeffrey R. Vincent eds. 2003). In technical terms, CBA pursues Kaldor-Hicks, rather than Pareto, efficiency. The latter standard only approves projects that make at least one individual better off and no one worse off. The former standard approves projects so long as "losers" could, in theory, be compensated adequately from project gains to make them no worse off. *See* Joseph Persky, *Cost-Benefit Analysis and the Classical Creed*, 15 J. Econ. Perspectives 199, 201 (2001). What this means in plain terms is that CBA only seeks to promote value as such and does not compensate those who lose from the enhancement of efficiency. *See* Nicholas Kaldor, *Welfare Propositions of Economic and Inter-personal Comparisons of Utility*, 49 Econ. J. 549, 550 (1939).

In order to compare costs and benefits, CBA evaluates policy choices' diverse consequences according to a single numerical rubric. Accordingly, the framework asks regulators to predict, weight, and

aggregate policy impacts in dollar terms. Once relevant policy impacts have been estimated and monetized in this manner, regulators can use CBA to select the point of marginal equivalence between social costs and benefits. Similarly, many economists and other commentators believe that application of CBA to a range of existing and proposed risk regulation programs can provide society with a basis for making efficient use of the entire regulatory budget that it devotes to risk prevention. *See generally* Stephen Breyer, *Breaking The Vicious Circle: Toward Effective Risk Regulation* (1993).

In theory, CBA values anticipated policy effects according to the monetary amount that affected individuals would be willing to pay if the effect under consideration were traded in an economic market. *See* Kenneth J. Arrow et al., *Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?*, 272 Science 221, 222 (1996). This willingness-to-pay approach to valuation makes the desirability of CBA's results contingent on the desirability of the underlying distribution of wealth and entitlements out of which valuations are being generated.

Once EPA identifies a technology capable of reducing environmental impacts, it can use market data to estimate facilities' compliance costs, which constitute the principle direct cost of regulation. Neither the consideration of cost nor this approach to its valuation is unique to CBA.

Valuation of regulatory benefits – consisting of averted harms such as human death and illness, species loss, or environmental degradation – poses greater challenges. EPA can often choose the best technologies for minimizing environmental impacts by simply comparing the percentage of effluent or water intake reduction of competing technologies. To do this, the agency does not need to know anything about the quality of adjacent waters.

To *quantify* and *monetize* the environmental benefits a technology might generate, however, EPA must consider the quality of adjacent waters and the myriad ecological impacts that effluent or water intake might have. These values and impacts will vary. For waters most in need of environmental improvement, the value of benefits may be less than for waters that require little protection. Water intake technologies may protect few fish in depleted fisheries (at least in the short run), but may generate high benefits estimates in waters with a thriving fishery.

CBA typically entails the monetization of quantified benefits based on individual willingness to pay. Existing markets will not provide reliable price information for such benefits. Accordingly, in the environmental context, the CBA practitioner must attempt to identify individual valuations of averted harms through indirect or hypothetical means. Even within the economics profession, much theoretical and methodological controversy has surrounded the development and use of such valuation techniques. *See, e.g.*, Amartya Sen, *The Discipline of Cost-Benefit*

Analysis, 29 J. Legal Stud. 931, 949 (2000) (strongly criticizing conventional willingness-to-pay measurement approaches).

B. By its Nature, Cost-Benefit Analysis Cannot Address Many Aspects of Law and Policy

CBA embraces welfare economic assumptions about how value is defined and measured. According to economic theory, willingness to pay reflects the strength of individual preferences for various goods. Use of a methodology based on estimates of private preferences for avoiding death, illness, and environmental degradation assumes that people's purchase decisions should determine value. *See* Bryan Norton, Robert Costanza, and Richard C. Bishop, *The Evolution of Preferences: Why 'Sovereign' Preferences May Not Lead to Sustainable Policies and What to Do About It*, 24 Ecol. Econ. 193 (1998). Thus, the weight assigned to matters as basic as the existence of a fish species or the death of a human being derives from individualistic market behavior.

This contrasts with a model of collective value choices, such as political choices that create individual rights or give special weight to matters deemed fundamentally important for reasons not rooted in welfare economics. *Cf.* Richard O. Zerbe, Jr., *Comment: Does Benefit Cost Analysis Stand Alone? Rights and Standing*, 10 J. Pol'y Analysis & Mgmt. 96, 96 n.2 (1991) (observing that when uncertainty

over legal rights "extends beyond the margin, benefit cost analysis will be of little help"); James M. Buchanan, *Freedom in Constitutional Contract: Perspectives of a Political Economist* (1977); Laurence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 Yale L. J. 1315 (1974). This Court has implicitly held that Congress made such value choices in the Clean Air Act and the Endangered Species Act. *See TVA v. Hill*, 437 U.S. 153, 176-84 (1978) (recognizing that Congress decided to save each endangered species, no matter what the cost); *Whitman v. American Trucking Ass'ns, Inc.*, 531 U.S. 457, 465 (2001) (recognizing that Congress chose, in the Clean Air Act, to protect public health). In the CWA, this Court has likewise recognized that Congress chose to adopt an overarching goal of ecological restoration, *U.S. v. Riverside Bayview Homes*, 474 U.S. 121, 132-33 (1985) (describing the CWA as a "comprehensive legislative attempt 'to restore'" the waters' ecological integrity), which is served by subsidiary goals of zero discharge of pollutants and protection of fish, *see* 33 U.S.C. § 1251.

When such goals are recognized as politically- or normatively-imposed constraints, economic theory evaluates them under frameworks that are analytically distinct from conventional cost-benefit optimization. For instance, an extensive economic literature exists analyzing environmental and natural resource decisionmaking under "sustainability" or "safe minimum standard"

constraints. *See, e.g.*, Alan Randall & Michael C. Farmer, *Benefits, Costs and the Safe Minimum Standard of Conservation, in The Handbook of Environmental Economics* 26 (Daniel Bromley ed. 1995); Richard B. Howarth, *Sustainability Under Uncertainty: A Deontological Approach*, 71 Land Econ. 417 (1995); Richard B. Norgaard & Richard B. Howarth, *Sustainability and Discounting the Future, in Ecological Economics: The Science and Management of Sustainability* 88 (Robert Costanza ed. 1991); Richard C. Bishop, *Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard*, 60 Am. J. Ag. Econ. 10 (1978).

Taking the ecological restoration goal seriously requires efforts on a variety of fronts when the immediate benefits produced are small. CBA, however, calls for scaling down efforts when resources are in serious trouble, because then individual actions produce small measurable marginal benefits. Furthermore, the ecological restoration goal requires confronting the complex, causally interrelated nature of ecosystems, which often frustrates attempts to manage for allocative efficiency. *See* Orrin H. Pilkey & Linda Pilkey Jarvis, *Useless Arithmetic* 6-7, 10-21 (2007) (explaining how reliance on widely used mathematical models to set sustainable catch levels led to a fisheries collapse). CBA, for instance, struggles to address catastrophic or non-linear potentialities, since CBA typically assumes a smooth continuous world in which median expectation values provide reasonably reliable decision criteria. Martin

Weitzman, *The Stern Review of the Economics of Climate Change*, 45 J. Econ. Lit. 703 (2007) (questioning the value of conventional CBA in the face of climate change's deep structural uncertainty and potentially extreme worst case consequences).

Even assuming complete and reliable information, CBA would not prove useful in all law and policy contexts. Any formal decisionmaking system such as CBA must – by its very nature – exclude from evaluation some relevant parameters of the decisions that the system aims to resolve. CBA may be appropriate in some circumstances, but it is not an alternative to foundational political choices like those found in the Constitution and, in some cases, in environmental law. It is imperative, therefore, to recognize that CBA cannot be "read into" all of a society's statutes or viewed as an all-purpose policy device. *Cf. Burnham v. Superior Court*, 495 U.S. 604, 626 (1990) (Scalia, J., plurality opinion) (criticizing "totality of the circumstances" and "freestanding 'reasonableness'" tests in the due process context and warning against "injecting them into the core of our American practice").

II. COST-BENEFIT ANALYSIS IS NOT RELEVANT TO IDENTIFICATION OF THE BEST TECHNOLOGY AVAILABLE FOR MINIMIZING ADVERSE ENVIRONMENTAL IMPACT

As Congress's agent, EPA must follow statutory instructions establishing policies for EPA rulemaking.

Therefore, when used to implement specific statutes, EPA's economic analysis must examine the factors that congressional policies make relevant, without considering factors irrelevant to its instructions. *See Donovan,* 452 U.S. at 507-12 (holding that cost-benefit analysis is not a relevant factor when a statute demands maximum feasible emission reductions); *Citizens to Preserve Overton Park v. Volpe,* 401 U.S. 402, 411-13 (1971) (holding that cost-benefit balancing was not among the relevant factors for determining whether it was "feasible" to route a highway around a park); *Union Electric Co. v. EPA*, 427 U.S. 246, 257-65 (1976) (holding that cost is not a relevant factor in EPA assessment of state implementation plans under the Clean Air Act). The relationship of costs to benefits is not among the factors relevant to determining the "best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b).

A. Engineering Analysis Identifies the "Best" Technology for Minimizing Adverse Environmental Impact

Identification of the "best technology . . . for minimizing environmental impacts" requires an engineering analysis of competing technologies' environmental performance characteristics. In the effluent reduction context, the "best" technologies generally minimize the amount of water pollution being discharged. *See Crushed Stone,* 449 U.S. at 74

(describing BAT as committing "the maximum resources economically possible to the" pollution elimination goal); *see also Alaska*, 540 U.S. at 489-90 n.13 (describing requirements for "best available control technology" as requiring "the technology that can *best reduce pollution* within practical constraints") (emphasis added). The focus on water intake in § 316(b) generally requires an inverse analysis focused on identifying technologies that minimize the amount of water taken from lakes, streams, and rivers to cool industrial facilities. As a rule, technologies minimizing water intake kill less fish and disrupt a water body's ecology less than technologies that use more water. *See Riverkeeper II*, 475 F.3d at 101 n.16 (noting EPA's general assumption that reductions in water flow proportionally reduce impingement and entrainment); *Riverkeeper I*, 358 F.3d at 194 ("EPA acknowledges that dry cooling" virtually eliminates water intake and "dramatically reduces impingement and entrainment").

The analysis of which technologies minimize adverse environmental impacts may take into account a broad range of impacts. EPA may, for example, take into account adverse air pollution impacts associated with water pollution technology. *See, e.g., Riverkeeper I*, 358 F.3d at 194-95 (allowing EPA to consider the air pollution associated with energy efficiency penalties for dry cooling technology as a basis for rejecting it); *Riverkeeper II*, 475 F.3d at 99 n.11 (describing its prior decision to uphold

EPA's rejection of dry cooling as based on its negative environmental effects and unbearable cost). The amount of economic cost a facility will incur to install a technology, such as an environmentally superior water intake system, has no bearing on the question of which technology minimizes adverse environmental impacts.

Market participants generally use the term "best" in conjunction with any technology to signify the highest quality item regardless of cost. *See generally Bailey v. U.S.*, 516 U.S. 137, 144-45 (1995) (holding that courts must give a term its ordinary meaning considering not just its "bare meaning," but also its "placement and purpose" in context). Thus, consumer discussions of whether a Blackberry or an I-Phone is the "best" cell phone or whether an Apple or a PC is the "best" computer focus on design and features, *i.e.* on figuring out which technology works best for its intended purpose. Similarly, advertisers use the term "best" as a signifier of high quality. *See, e.g.*, Bradley Johnson & Alice Z. Cuneo, *AT&T, Goodby Look to Ax mLife*, Advertising Age, July 14, 2003, at 1, 26 (contrasting advertisements focused on price with the claim that AT&T has the "best technology"); *Ad Spending of '100' Edges Upward, Advertising Age*, Sept. 28, 1988, at 36 (describing Bell Atlantic as having the "best technology" because its telecommunications capabilities are the "fastest, with the most interesting applications.").

Economists, however, sometimes use the term "best policy" as signifying a balance between cost and

benefits. And, similarly, consumers sometimes use the term "best purchase" to signify a balance between costs and benefits. But the term "best technology," in ordinary parlance, means the best technology for its intended purpose – here *minimizing* (not just addressing) environmental impacts.

B. Economic Analysis Comparing Costs to Facilities' Economic Capabilities Evaluates a Technology's "Availability"

However, § 316(b) qualifies its demand that EPA formulate standards based upon the environmentally best technologies by insisting that the technologies be "available." 33 U.S.C. § 1326(b). A technology that is technically or economically infeasible may not be available. *See National Crushed Stone,* 449 U.S. at 75 (describing the best available technology provisions as requiring employment of the "best measures economically and technologically feasible"); Driesen, *Feasibility Principle*, *supra*, at 21 (describing BAT requirements as exemplars of the feasibility principle, which maximizes reductions except when doing so causes widespread plant shutdowns). Accordingly, EPA properly employs economic analysis to determine whether a technology is available.

Economic analysis focused on technological availability models the relationship of costs to regulated facility owners' economic capabilities. *See Alaska,* 540 U.S. at 498 (upholding EPA's rejection of a disproportionate cost argument, because a finding

of economic infeasibility requires financial data, which the regulated firm withheld). This financial analysis of an industry, combined with an analysis of technical feasibility (whether the technology works properly for the industry as a whole), allows the agency to determine the limits of firms' capabilities. *See Donovan*, 452 U.S. at 508-09 (defining feasible regulation as that which is "capable of being done . . . "); *see, e.g., Riverkeeper I,* 358 F.2d at 195 (EPA found "dry cooling" technically infeasible for some facilities). Thus, in regulating water intake, EPA compared the costs of technologies reducing water intake to the revenues of the regulated facilities, Final Rule EBA, *supra,* at B2 (analyzing cost to revenue ratios at the firm and facility level); *Riverkeeper I,* 358 F.3d at 194 n.21 (discussing the percentage of revenue necessary to fund "dry cooling" technology), in order to evaluate whether environmentally desirable technologies were economically available to the industry, *see id.* at 195 (EPA found that dry cooling requirements for new facilities would discourage their construction); *Riverkeeper II,* 475 F.3d at 99 n.11 (characterizing *Riverkeeper I* approval of EPA's rejection of dry cooling as "ultimately" based on EPA finding dry cooling "too expensive for industry to reasonably bear" and air pollution impacts); *see also* Pet.App.272a-273a (69 Fed. Reg. at 41,608-09) (finding dry cooling unavailable for existing facilities because it "carries costs that would potentially cause significant closures."). If the cost of an environmentally valuable technology creates a

long-term excess of cost over revenue, requiring that technology may lead to bankruptcy and/or the shutdown of facilities. *See Effluent Limitations for the Meat and Poultry Products Point Source Category*, 69 Fed. Reg. 54,476, 54,511, 54,514 (September 8, 2004) (closure comes from regulation producing "negative long-term earnings" at the facility or company level). A rule that shuts down a significant portion of an industry does not cause the technology to be employed, because it may not be economically available to the industry as a whole.[5]

Accordingly, in evaluating technological availability, EPA frequently uses economic models focused on industry finances. *See, e.g., National Wildlife Federation (NWF) v. EPA*, 286 F.3d 554, 565 (D.C. Cir. 2003) (discussing EPA's use of the Altman bankruptcy model); *Effluent Limitations for the Iron and Steel Manufacturing Source Category*, 67 Fed. Reg. 64,216, 64,244 (October 17, 2002) (*Iron & Steel*) (EPA selected Altman's Z model to evaluate bankruptcy possibilities after a review of corporate financial distress models in the economic literature).

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[5] Likewise, if the compliance cost associated with a technology required of new sources becomes so onerous that new facilities do not open, it might be correct to say that the technology is not "available" to new facilities. *See Effluent Limitations for the Industrial Laundries Point Source Category, Withdrawal of Proposed Rule*, 64 Fed. Reg. 45,072, 45,079 (August 18, 1999) (EPA conducts a "'barrier-to-entry analysis' to determine whether . . . compliance costs would have prevented a new source from entering the market.").

Financial analysts and others use financial models to evaluate whether a projected cost increment might bankrupt firms and/or lead to facility closures. *See* Edward A. Altman & Edith Hotchkiss, *Corporate Financial Distress and Bankruptcy* 234-35 (2006) (discussing financial institutions' use of models to predict repayment risk). Such models may take into account earnings, assets, liabilities, and other factors relevant to predicting bankruptcy or closures. *See id.* at 241-43 (discussing model components).

Economists use a concept of price elasticity to analyze the question of when facility owners must bear costs imposed on them in order to avoid sales declines or, instead, will succeed in passing them on to customers. *See, e.g., Effluent Limitations for the Metal Products and Machinery Point Source Category Notice of Data Availability*, 67 Fed. Reg. 38,752, 38,769 (June 5, 2002) (*Metal Products*) (stating that EPA estimated the "cost elasticity of price."). For goods and services with few or no substitutes, consumer demand may remain steady even as prices rise. *See Effluent Limitations for the Transportation Equipment Cleaning Point Source Category*, 65 Fed. Reg. 49,666, 49,688 (August 14, 2000) (predicting that price increases would cause little decline in output in a sector offering an essential service). Industry competitiveness is also relevant to a firm's ability to pass on costs and, thus, EPA employs econometric models and analyzes market structure to estimate how much of projected regulatory cost facilities must actually pay. *See, e.g., Metal Products*, 67 Fed. Reg. at

38,768-69. Price rises reflecting regulatory costs, if significant and not shared by all relevant competitors, can cause a firm to lose market share, another possible route to bankruptcy. *Cf.* Adam B. Jaffe et al., *Environmental Regulation and the Competitiveness of U.S. Manufacturing, What Does the Evidence Tell Us?,* 33 J. Econ. Lit. 132, 157 (1995) (environmental regulation has little impact on U.S. competitiveness); *Pharmaceutical Manufacturing Category Effluent Limitations Final Rule,* 63 Fed. Reg. 50,388, 50,408 (September 21, 1998) (*Pharmaceutical Manufacturing*) (analyzing whether rule might encourage new facilities to locate outside the United States). In sum, financial models provide tools for evaluating the many economic factors associated with assessing a technology's economic availability to an industry. *See Metal Products,* 67 Fed. Reg. at 38,770-71 (discussing several different models).

This availability requirement has imposed significant restraints on the EPA's ability to require the best technologies. Courts have remanded rules to EPA when it failed to adequately consider affordability in cases where there might be a serious issue in that regard. *See, e.g., National Renderers Ass'n v. EPA,* 541 F.2d 1281, 1288-89 (8th Cir. 1976) (finding a water pollution rule arbitrary because EPA did not adequately consider whether costs would affect the economic viability of medium-sized facilities). And EPA has sometimes refused to require the best performing technology, when it determines

that a rule based on that technology will close a large number of facilities. *See, e.g., id.* at 1288 & n.7 (noting that EPA exempted small facilities from its rule, because it predicted many of them would otherwise close); *NWF,* 286 F.3d at 565 (accepting EPA's conclusion that a particular technology is not achievable because requiring it would lead to bankruptcies).

Analysis of the relationship between costs and benefits does not reveal whether a technology is economically available. *See Pharmaceutical Manufacturing*, 63 Fed. Reg. at 50,403 (stating that the agency's economic analysis includes "the impacts of these rules" on firms and "*also*" a cost-benefit analysis) (emphasis added); *Effluent Limitations for the Industrial Laundries Point Source Category*, 64 Fed. Reg. 45,072, 45,078 (August 18, 1999) (describing evaluation of facility closures, firm failures, and cost-benefit analysis as separate components of its economic assessment); *Iron and Steel*, 67 Fed Reg. at 64,243 (describing an evaluation of "corporate financial distress" and cost-benefit analysis as separate components of a regulatory impact analysis). Instead, CBA shifts the focus from availability to a broad question about whether pollution control is desirable in a given instance, a question not mentioned in section 316(b). *See Riverkeeper II,* 475 F.3d at 98 n.10 (citing OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs,* Appendix

A (1992)) (CBA is a method of assessing a policy's *desirability*) (emphasis added).

To see CBA's irrelevance to technological availability, consider a simplified example in which a firm generating $500,000 in annual revenue must employ an environmental technology requiring $1 million in additional annual cost. This cost produces $10 million in incremental annual monetized environmental benefits. Because annual cost exceeds annual revenue, this technology is not economically available to the firm, but requiring this technology would be economically efficient, because the overall benefits to society exceed the costs. Conversely, imagine that the same $1 million annual incremental expenditure occurs at a facility generating $1 billion in annual revenue, but generates only $1,000 in annual incremental benefits. In this case, the measure may be economically available to the facility, but a rule based on it would be economically inefficient (assuming that all environmental benefits have been accurately estimated and appropriately valued). In each case, conclusions about a technology's availability hinge on analysis of the firm's finances rather than on the relationship between costs and benefits. Financial analysis of costs' predicted impacts on regulated firms' operations in light of their economic capabilities provides useful information about a technology's economic availability. Monetization and quantification of benefits provides no information relevant to assessing a technology's economic availability.

Economic analysis of the question of whether a proposed rule will trigger plant shutdowns focuses upon the distribution, not the total amount, of costs. *Cf.* I A Legislative History of the Water Pollution Control Act Amendments of 1972 (Comm. Print 1973) (Leg. Hist.) at 156, 217, 352-53, 375, 452, 456-57, 467, 480, 513-15, 561, 564-65, 613, 656-58, 731-33, 735-36, 738, 743-45, 1128-29, 1143, 1157, 1173, 1215, 1286, 1353-55, 1358-61 (showing overwhelming Congressional focus on the job loss issue). A high cost imposed on a very profitable facility might lead to employment increases, as plant managers hire technicians to install and operate equipment reducing environmental impacts. *See* Goodstein, *supra,* at 171. Conversely, a relatively modest cost imposed on a marginal facility might lead to a shutdown, causing significant unemployment. Hence, economic models that compare costs to facilities' economic capabilities implicitly focus on cost distribution.

Not only does analysis of direct job losses require a form of analysis focused on cost distribution rather than aggregate costs and benefits, but the concern about job loss itself constitutes a distributional concern. *See* Driesen, *Feasibility Principle,* at 35-37. A complete loss of income constitutes a heavily concentrated cost for the worker losing a job, having a significant impact on the worker concerned. *See id.* at 37 (describing the impact). The same amount of cost producing widespread but modest price increases usually does not implicate Congressional concerns about immediate plant shutdowns. *See id.* at 35-36

(explaining why widely distributed costs tend to have insignificant impacts). Congressional focus on availability thus reflects political concern for costs' distribution, rather than maximization of net benefits.

Economic theory recognizes that cost-benefit analysis, because of its focus on economic efficiency, does not resolve distributional questions. *See* Jonathan Lesser, Daniel Dodds & Richard Zerbe, Jr., *Environmental Economics and Policy* 211 (1997) (recognizing the rationality of pursuit of "non-economic goals," such as equity); Arrow *et al.*, *supra,* at 221 (describing "concerns about fairness" as "important noneconomic factors that merit consideration"). Quantification and monetization of benefits does not help to analyze the distributional concerns implicated by the legislature's emphasis on technological availability.

C. Cost-Benefit Analysis Is Irrelevant to Cost Effectiveness Analysis

The Second Circuit held that EPA may consider "cost effectiveness" in crafting its standards. *Riverkeeper I,* 475 F.3d at 98 (Congress intended that EPA use cost effectiveness analysis in designing BAT standards). Cost effectiveness analysis identifies the cheapest means of achieving a predetermined goal. *Id.* at 98 n.10 (citing OMB Circular A-94) (describing cost effectiveness as a "systematic quantitative method for comparing the costs of alternative means

of achieving the same . . . given objective."). Concerns about cost effectiveness motivate a very substantial economic literature on the form of regulation, and lie behind economists' support for pollution taxes and emissions trading. *See, e.g.*, Lesser, Dodds & Zerbe, Jr., *supra*, at 231-33; W.D. Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. Econ. Theory 395 (1972).

The economic literature teaches that cost effectiveness analysis does not involve monetization or quantification of benefits and is therefore analytically distinct from CBA.[6] To carry out a cost effectiveness analysis, EPA must identify and compare the cost of several technologies or approaches capable of meeting its previously determined goal. Under § 316(b), this previously determined goal is the minimization of adverse environmental impacts from cooling water intake and it is pursued through evaluation of the environmental capabilities of various available technologies.

EPA may establish a performance standard based on the best available technology's capabilities, while

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[6] *See, e.g.*, Scott Callan & Janet Thomas, *Environmental Economics & Management: Theory, Policy, and Applications* 170 (4th ed. 2007); Barry Field, *Environmental Economics: An Introduction* 13 (1994); Ahmed Hussen, *Principles Of Environmental Economics* 188 (2d ed. 2000); Lesser, Dodds & Zerbe, Jr., *supra*, at 230; Roger Perman, Yue Ma & James McGilvray, *Natural Resource and Environmental Economics* 222 (1996); Clifford Russell, *Applying Economics to the Environment* 117 (2001); Tietenberg, *supra*, at 48-50.

allowing facilities to use technologies other than the technology EPA identified as the best, including technologies invented after the rule's promulgation, to meet the standard. *See generally* Tietenberg, *supra*, at 48-49. This approach invites facility owners to carry out a cost effectiveness analysis to determine which technologies provide the cheapest means of achieving agency goals. Regulated firms usually have better information than EPA does about the marginal cost of employing various technologies at their own plants. This "information asymmetry" supports EPA's practice of allowing firms some flexibility in choosing technologies to meet EPA standards. *See generally* Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 Am. Econ. Rev. 393, 404 (1980) (discussing market implications of information asymmetry). But the ratio of costs to benefits has no bearing on whether a particular approach offers the cheapest way to meet a predetermined goal. *See* Clifford Russell, *Applying Economics to the Environment* 112-13 (2001) (describing cost-effectiveness as "an application of constrained optimization" that provides an alternative to CBA); Wallace E. Oates, *From Research to Policy: The Case of Environmental Economics*, 2000 U. Ill. L. Rev. 135, 135 (noting that standards under the CWA are to be set "with little regard to their economic implications").

The distinction between CBA and cost effectiveness analysis is especially important in a system of distributed political power, where one

governmental body might wish to delegate only part of its authority to another. Whereas petitioners and their supporters analogize regulatory CBA to "everyday life" decisions such as the purchase of an automobile, Federal Brief at 13, the better analogy is to decisions in which authority, resources, expertise, and responsibility are spread among multiple parties. In such contexts, individuals might properly hesitate to confer authority on agents to seek overall efficiency.

For instance, a client might delegate decisions about how to litigate a case to an attorney, but reserve to itself the decision about when to settle in light of anticipated costs and benefits. Or a parent might offer to purchase the automobile of a teenage child's choosing, but still limit the extent to which the child could trade off safety for other factors like speed or styling. A rational policymaker might choose in these contexts *not* to delegate authority to seek overall efficiency, but instead to establish more specific policies to guide the agent's decisionmaking. *See* I Leg. Hist. at 518-19 & n.1 (showing Congressional consideration of CBA).

III. EPA'S COST-BENEFIT ANALYSIS ILLUSTRATES WHY CONGRESS MAY RATIONALLY HAVE REJECTED ITS USE IN § 316(B)

Although now generally cited as an unequivocal supporter of CBA, Professor Sunstein has argued both that "there is a large difference between CBA and standards of feasibility or achievability," and that the latter "might be preferred . . . on the ground that they greatly ease the agency's task, and in a way that makes people far better off on balance." Cass R. Sunstein, *Is Cost-Benefit Analysis for Everyone?*, 53 Admin. L. Rev. 299, 311 (2001). EPA's attempt to transform the feasibility standard of § 316(b) into a cost-benefit standard supports Professor Sunstein's claim.

A. Incomplete Information Made the Phase II Cost-Benefit Analysis Unreliable

In the Phase II rulemaking, EPA focused on "reductions in impingement and entrainment as a quick, certain, and consistent metric for determining performance." Pet.App.169a (69 Fed. Reg. at 41,586). Increased fish survival became the primary determining factor of the rulemaking because – at least for those fish that are commercially or recreationally valuable – that factor offered an ecological benefit that was readily quantifiable and monetizable.

As the agency acknowledged, however, the potential impact of cooling water intake structures is much broader and more complex than these quantified mortality effects. *See* EPA, Regional Analysis Document for the Final Section 316(b) Phase II Existing Facilities Rule, EPA-821-R-02-003, February 12, 2004, at A9-1 (Final Rule RS) (documenting numerous ways in which "the organisms lost to [impingement and entrainment] are critical to the continued functioning of the ecosystems of which they are a part" and in which those ecosystems provide valuable "ecological and public services").[7] Among these broader impacts was an unknown but nontrivial level of harm posed to threatened or endangered species. *See* Pet.App.173a-174a (69 Fed. Reg. at 41,587).

Such additional environmental impacts, however, received no monetary value in EPA's economic analysis. Indeed, as the agency candidly admitted, even its focus on impingement and entrainment losses was highly incomplete, as it only accounted for losses insofar as they impacted commercial and recreational fish harvests; hence, the agency "was not able to monetize benefits for 98.2% of the age-one equivalent losses of all commercial, recreational, and forage species for the section 316(b) Phase II regulation." Final Rule EBA, *supra,* at C3-2. *See also*

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[7] This document is available at http://www.epa.gov/waterscience/316b/phase2/casestudy/final.htm.

Pet.App.499a (69 Fed. Reg. at 41,661) ("The Agency's direct use valuation does not account for the benefits from the remaining 98.2% of the age 1 equivalent aquatic organisms estimated to be protected nationally under today's rule.").

In light of such incompleteness and uncertainty, the agency warned that "[t]o rely only on estimated use values would substantially undervalue the benefits of the final section 316(b) rule." Final Rule RS, *supra,* at A9-8. Elsewhere, the agency offered the sage advice that "[a] comparison of complete costs and incomplete benefits does not provide an accurate picture of net benefits to society," Final Rule EBA, *supra,* at D1-5, and that "there is a real possibility that ignoring non-use values could result in serious misallocation of resources," Pet.App.499a (69 Fed. Reg. at 41,660). Nevertheless, the agency ultimately appeared to give these unquantified benefits no weight in its conclusion about whether closed cycle cooling was acceptable. *See* Final Rule EBA, *supra,* at D1-4 (mentioning only monetized benefits).

With so many effects remaining off the balance sheet, regulators had little reason to be confident that the conclusions offered by CBA were welfare-maximizing. Instead, alternative, more stringent standards of environmental protection might have been preferable to the CBA-based approach, given the many non-quantified environmental benefits of cooling water intake reduction. *See* Frank Ackerman, Comments on

Proposed Rule (August 1, 2002) at 9 tbl. 2, J.A. at 296 (discussing additional ecological impacts).

B. As Traditionally Understood and Implemented, the Technology-Based Standard of § 316(b) Would Have Avoided Limitations of EPA's Cost-Benefit Analysis

Even within the terms of welfare economics, non-efficiency maximizing policy approaches such as technology-based standards may appear desirable when evaluated in real world policy contexts, where information is incomplete and uncertain, where administrative resources are limited, and where technology is dynamically impacted by law itself. *See, e.g.*, Daniel H. Cole & Peter Z. Grossman, *When is Command-and-Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection*, 1999 Wis. L. Rev. 887, 888-89 (observing that historical, technological, and institutional factors can occasionally render technology-based approaches "the most efficient means of achieving a society's environmental protection goals"); Juan-Pablo Montero, *Pollution Markets with Imperfectly Observed Emissions*, 36 RAND J. Econ. 645 (2005) (demonstrating that when regulators can accurately monitor abatement technology but not emissions and output levels, standard-based approaches may outperform alternatives under certain market conditions).

Such second-best considerations are at the heart of the CWA, given the great difficulty experienced attempting to identify and enforce standards prior to the 1972 amendments. *Cf.* J. H. Dales, *Pollution, Property & Prices: An Essay in Policy-making and Economics* 39 (1968) (a leading economist's statement, prior to the Act's passage, that an economist cannot say that one policy is superior to another because he "is quite unable to draw up a neat table showing all benefits and costs"). As is well recognized, Congress's general approach in the amendments was to circumvent the informational demands, scientific uncertainties, and valuation questions that had frustrated the task of basing standards for dischargers on the effect of pollution on water quality. *See EPA v. State Water Resources Control Board*, 426 U.S. 200, 202-03 (1976).

Because the language of § 316(b) closely resembles the language of the most stringent technology-based standards in the CWA, EPA should have focused simply on the affordability of increasingly efficacious environmental control technologies, recognizing that Congress itself already had determined that the benefits of cooling water intake regulation are sufficiently vast and difficult to quantify that only the "best" control technology will suffice. Instead, EPA essentially relived the failed pre-1972 experience under the CWA through its failed effort to complete a reliable CBA of the Phase II rulemaking.

In this respect, it is useful to recall that the stated goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). The goal is *not* to view those waters as merely contingent resources, to be impaired or sacrificed at any moment for the promotion of an abstract and undifferentiated maximization of welfare.

Earlier, EPA seemed to recognize that allowing the degraded condition of a water body to reduce the level of legal protection that it receives – as the agency ultimately decided to allow through its CBA-based approach – would be inconsistent with the CWA's more dynamic, long-term goal of progressively restoring the ecological integrity of the nation's water bodies. *Cf.* Thomas O. McGarity, *Media-Quality, Technology, and Cost-Benefit Balancing Strategies for Health and Environmental Regulation*, 46 Law & Contemp. Probs. 159, 199 n.194 (1983) (quoting Senator Bayh as explaining that the technology-based standards of the CWA were intended to "force industry to do the best job it can do to clean up the nation's water and to keep making progress without incurring such massive costs that economic chaos would result"). When offering its proposed Phase II rule, for instance, EPA stated that, in addition to expressly quantified impacts, it was "concerned about the cumulative overall degradation of the aquatic environment as a consequence of . . . intakes located with or adjacent to an impaired waterbody." *See* 67 Fed. Reg. 17,122, 17,136 (April 9, 2002).

Conversely, a "comprehensive . . . attempt 'to restore'" the ecological integrity of waters, *Bayview Homes*, 474 U.S. at 132-33 (1985), through pollution controls, wetlands conservation, and other measures should increase fish populations, and therefore the value of the benefits of technology reducing water intake, over time. *See* EPA, Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule, EPA-821-R-02-001, February 2002, at C1-6, item 5.1[8] (acknowledging likely underestimation of benefits because current water quality has improved since the 20-year-old data relied upon was generated). Through its subtle shift from expressing concern over the impact of cooling water intake structures on impaired water bodies to using estimated impairment levels as an efficiency-oriented rationale for lowering levels of protection, EPA seemed to abandon the CWA's mandate to progressively restructure the economic and technological landscape that gives rise to any momentary depiction of costs and benefits.

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[8] This document is available at http://www.epa.gov/waterscience/316b/phase2/econbenefits/ (last visited September 30, 2008).

CONCLUSION

Regulators should use economic methods appropriate to the decision before them. CBA provides a tool for choosing allocatively efficient regulation. Other modes of economic analysis, however, fit a mandate to minimize environmental impacts within the limits of available technology.

Respectfully submitted,

PROF. DAVID M. DRIESEN
Counsel of Record
SYRACUSE UNIVERSITY
COLLEGE OF LAW
E.I. White Hall
Syracuse, NY 13244-1030
(315) 443-4218

PROF. DOUGLAS A. KYSAR
YALE LAW SCHOOL
127 Wall Street
New Haven, CT 06511
(203) 436-8970

APPENDIX: IDENTIFICATION OF *AMICI*

Frank Ackerman
Director of the Research and Policy Program,
Global Development and Environment Institute
Senior Economist, Stockholm Environment Institute
– US Center
Tufts University

Nathan Sivers Boyce
Associate Professor, Economics
Chair, Willamette University Sustainability Council
Willamette University

Peter Dorman
Faculty, The Evergreen State College

Eban Goodstein
Professor, Economics
Lewis & Clark College

Richard B. Howarth
Pat and John Rosenwald Professor,
Environmental Studies Program
Dartmouth College
Editor-in-Chief, *Ecological Economics*

Peter B. Meyer
Professor Emeritus, Urban Policy and Economics
Director Emeritus, Center for Environmental
Policy and Management
School of Urban and Public Affairs
University of Louisville

Julie A. Nelson
Associate Professor, Economics
University of Massachusetts, Boston
Senior Research Fellow, Global Development
and Environment Institute

Richard B. Norgaard
Professor, Energy and Resources
University of California, Berkeley

Thomas Michael Power
Research Professor, Economics
University of Montana

Kristen Sheeran
Associate Professor, Economics
St. Mary's College of Maryland
Executive Director, Economics for Equity
and the Environment: E3 Network

Benjamin K. Sovacool
Adjunct Assistant Professor, Government
& International Affairs Program
Virginia Polytechnic Institute & State University

Lyuba Zarsky
Associate Professor, Graduate School of International
Policy Studies
Monterey Institute of International Studies

AMICUS CURIAE BRIEF

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In the Supreme Court of the United States

ENTERGY CORPORATION, *Petitioners,*

v.

ENVIRONMENTAL PROTECTION AGENCY, *ET AL.*, *Respondents.*

PSEG FOSSIL LLC, *ET AL.*, *Petitioners,*

v.

RIVERKEEPER, INC., *ET AL.*, *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., *ET AL.*, *Respondents.*

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF FOR ENVIRONMENT AMERICA AND THE CENTER FOR BIOLOGICAL DIVERSITY AS AMICI CURIAE SUPPORTING RESPONDENTS

CHARLES C. CALDART
JOSEPH J. MANN
NATIONAL ENVIRONMENTAL LAW CENTER
1402 Third Avenue
Suite 715
Seattle, WA 98101
(206) 568-2853

CHRISTOPHER J. WRIGHT*
TIMOTHY J. SIMEONE
S. ROBERTS CARTER III
HARRIS, WILTSHIRE & GRANNIS LLP
1200 Eighteenth St., N.W.
Washington, DC 20036
(202) 730-1300
**Counsel of Record*

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QUESTION PRESENTED

Whether Section 316(b) of the Clean Water Act authorizes the Environmental Protection Agency to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

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INTEREST OF AMICI

The amici joining this brief ("the Environmental Amici") are groups with considerable experience advocating for positions that will help to achieve Congress's goals in enacting the Clean Water Act ("CWA").[1] Section 316(b) of the Act regulates cooling water intake structures, which are commonly used by power plants and other large facilities.[2] Cooling water intake structures kill fish and large aquatic animals by trapping them against grills or screens, which is known as "impingement," and kill smaller creatures by drawing them into the cooling mechanism, which is known as "entrainment." Section 316(b) requires cooling water intake structures to use the "best technology available for minimizing adverse environmental impact" ("BTA"), and directs EPA to include BTA requirements in the pollution discharge standards it issues under sections 301 and 306 of the Act. Although the best guide to the meaning of the BTA standard is the language used by Congress in section 316(b), the plain meaning of that language is supported by the meaning of similar phrases in sections 301 and 306 – particularly "best available technology" ("BAT") in section 301(b)(2)(A) and "best available demonstrated control technology" ("BADT") in

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[1] Petitioners and respondents other than EPA have filed letters with the Court consenting to the filing of amicus briefs in this case, and EPA has consented to the filing of this brief. No one other than counsel for amici wrote this brief, in whole or in part, and no one made a monetary contribution to its preparation.

[2] Throughout this brief, we refer to the relevant statutory provisions by their Clean Water Act section number. The corresponding U.S. Code section number may be found in the Table of Authorities.

section 306(a)(1).[3]

The Environmental Amici submit this brief primarily to rebut inaccurate arguments advanced by one petitioner and two amici concerning the BAT and BADT standards. *See, e.g.*, Entergy Br. 38-42 ("Sections 301 And 306 Either Mandate Or Permit Cost-Benefit Analysis"); NAHB Br. 14-20; American Chemistry Council *et al.* ("ACC") Br. 22-26. In particular, contrary to their contentions, this Court concluded in *EPA v. National Crushed Stone Ass'n*, 449 U.S. 64 (1980), that EPA may not use a cost-benefit analysis when establishing BAT standards. While Entergy claims that the Second Circuit's decision in this case "rests in part on a misreading" of *National Crushed Stone*, Entergy Br. 41, it is Entergy and its amici rather than the Second Circuit that have misread that decision.

The Environmental Amici fully support the position of respondents Riverkeeper, Inc. *et al.*, that a cost-benefit analysis is impermissible under the BTA standard of section 316(b). The Environmental Amici also agree that a proper understanding of the BAT and BADT standards in sections 301 and 306

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[3] The National Association of Home Builders ("NAHB"), an amicus supporting petitioners, helpfully included a chart in its brief (at pages 10-11) that catalogues the relevant standards by acronym – in addition to BTA, BAT, and BADT, the statute refers to the "best practicable control technology currently available" ("BPT") and the "best conventional pollution control technology" ("BCT"). The chart also provides references to the key statutory provisions relating to each standard. (There is one error: the entry regarding the CWA provision establishing the BCT standard erroneously cites section 304(b)(2)(E) rather than section 301(b)(2)(E)). The statutory provisions are set forth in the addendum to the brief filed by petitioners Entergy Corp., *et al.*

supports that conclusion. Further, Environmental Amici believe that an examination of the section 301 and 306 standards demonstrates that Congress did not, as petitioners argue, intend the BTA standard to be implemented on a site-by-site basis. *See* Entergy Br. 46-47; Utility Water Act Group ("UWAG") Br. 50.

But whatever the Court decides concerning the BTA standard, this Court should not accept Entergy's invitation to rewrite the law governing the BAT and BADT standards, which require an inquiry into costs but do not permit the use of a cost-benefit analysis. Entergy's revisionist interpretation of the BAT and BADT standards is at odds not only with the language, structure, and history of sections 301, 304, and 306, but also with the clearly articulated goals of the Act.

INTRODUCTION

Contrary to the impression given by petitioners and their amici, the issue in this case is not whether EPA may consider the costs of implementation in setting standards under section 316(b) of the Clean Water Act. It may and it should.

Petitioners and their amici contend, however, that EPA ought to conduct a cost-benefit analysis – that the agency ought to consider costs in relation to water quality benefits – and that it should base its section 316(b) decision-making on the results. They advance two versions of such an analysis. Petitioners appear to favor the stricter version, which would require that all costs and benefits be monetized and reduced to present value, and would permit requirements designed to reduce environmental damage only when the resulting dollar value of the

benefits outweighs the dollar value of the costs. In our view, neither section 316(b) nor any other provision of the Clean Water Act authorizes this strict cost-benefit approach as a means of setting technology-based standards. The other version of cost-benefit analysis permits the use of technology that is not the best at reducing pollutant discharge only where the cost of such technology is "wholly out of proportion" to the marginal level of reduction that would be achieved by its use. 118 Cong. Rec. 33,696 (1972), *quoted in E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 129 (1977), and *National Crushed Stone*, 449 U.S. at 71 n.10. Senator Muskie described this approach as a "'limited cost-benefit analysis'" in a passage twice quoted by this Court. *Id.* The Clean Water Act's BPT and BCT standards – which, as further set forth below, are different from the other standards in critical ways – require the application of a limited form of cost-benefit analysis.[4]

Petitioners' focus on cost-benefit analysis is misplaced in this case, which concerns only the BTA standard of section 316(b). That provision, like the BAT and BADT standards, calls for a cost *feasibility* analysis rather than cost-benefit analysis. As this Court noted in *American Textile Mfrs. Institute, Inc. v. Donovan*, 452 U.S. 490, 509-10 (1981), a cost-benefit approach is fundamentally inconsistent with a feasibility approach. Under a cost feasibility analysis, EPA must determine whether the costs of

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[4] In the quoted passage, Senator Muskie was describing the BPT standard. The BCT standard, the statutory delineation of which is similar to that of the BPT standard regarding comparison of costs and benefits, was added in the 1977 Clean Water Act Amendments. Senator Muskie's explanation of the reason for that addition is addressed below.

reducing or eliminating pollution to the degree produced by the best technology available "can be 'reasonably borne' by the industry." Pet. App. 26a;[5] *see also Chemical Mfrs. Ass'n v. EPA*, 870 F.2d 177, 262 (5th Cir. 1989) (same). As the Second Circuit explained, a technology that cannot be reasonably borne by the industry "is not 'available' in any meaningful sense." Pet. App. 24a.

The Second Circuit also concluded that EPA may engage in a "cost-effectiveness analysis" in applying the BTA standard. *Id.* at 26a. Relying on guidance issued by the Office of Management and Budget, the court described a cost-effectiveness analysis as "'[a] systematic quantitative method for comparing the costs of alternative means of achieving the same stream of benefits or a given objective.'" *Id.* at 23a n.10, *quoting* OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Appendix A (1992). Although petitioners and their amici belittle the cost-effectiveness approach, it is an inherent component of the federal regulatory program for environmental protection. Most environmental standards – like the cooling water intake standards at issue in this case – are what are commonly known as "performance" standards. They specify a performance goal (such as a maximum allowable level of a particular pollutant discharge), but do not specify a particular means for attaining that goal. The regulated entity thus is free to employ the most cost-effective (the cheapest) means of meeting the standard.

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[5] "Pet. App." citations are to the appendix filed by petitioner Entergy Corporation in No. 07-588.

While the Second Circuit concluded that EPA may properly consider both cost effectiveness and cost feasibility under section 316(b), the court held that this provision prohibits EPA from conducting a cost-benefit analysis. The Second Circuit rested that conclusion in part on this Court's construction of the BAT and BPT standards in *National Crushed Stone*. In that case, this Court addressed both the BPT standard that the Clean Water Act required polluters to meet by 1977, and the more environmentally protective BAT standard that applied beginning in 1987.[6] Relying on the statement of Senator Muskie, "the principal Senate sponsor of the Act," the Court concluded that the more lenient BPT standard called for a "'limited cost-benefit analysis'" to determine whether an "'additional degree of effluent reduction is wholly out of proportion to the costs of achieving such marginal level of reduction.'"[7] 449 U.S. at 71 n.10, *quoting* 118 Cong. Rec. 33,696. The Court also held that, once the stricter BAT standard took effect, "total cost is no longer to be considered in comparison to effluent

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[6] The 1972 Act set a 1983 deadline for implementation of the BAT standards. This was extended from 1984 to 1987 (depending on the circumstances) in the 1977 Clean Water Act Amendments, and the Court cited the 1987 deadline in *National Crushed Stone*. The BAT deadline was later extended to 1989 in the 1987 amendments to the Act.

[7] This cost-benefit comparison is "limited" not only because it employs a "wholly disproportionate" test, but also because the benefit component is not the level of environmental improvement attained through the pollutant reduction (or the level of societal benefits that flow from that improvement), but rather simply the level of pollutant reduction itself. In other words, Congress made the policy determination that any appreciable level of pollution reduction would be beneficial. As discussed below, consideration of water quality benefits is not a factor in setting the Act's technology-based effluent standards.

reduction benefits." 449 U.S. at 71. The Court concluded that the more environmentally protective BAT standard does not contemplate consideration of costs "in relation to effluent reduction," *id.* at 71 n.10, but rather contemplates "'eliminating the discharge of all pollutants'" if it is feasible to do so, *id.* at 75 n.14, *quoting* section 301(b)(2)(A).

The Second Circuit concluded that the BTA standard at issue in this case is more similar to the BAT standard than it is to the BPT standard, both because "best technology available" is linguistically very similar to "best available technology" and because section 316(b) does not reference any comparison of costs and benefits. Pet. App. 29a-31a. "[B]ecause 'Congress itself defined the basic relationship between costs and benefits,'" the Second Circuit concluded that EPA is not permitted to perform a cost-benefit analysis under section 316(b). *Id.* at 24a-25a, *quoting American Textile*, 452 U.S. at 509.

SUMMARY OF ARGUMENT

As respondent Riverkeeper has explained, the Second Circuit correctly concluded that a cost-benefit analysis is not permissible under section 316(b). But whatever this Court concludes concerning section 316(b), it should not rewrite the settled law that the BAT and BADT standards do not permit the use of cost-benefit analysis. In addition, there is no merit to petitioners' contention that CWA standards should be established on a case-by-case basis rather than by means of categorical regulations. While leaving room for variances in certain circumstances, Congress mandated principal reliance on rules of general applicability. Finally, there is ample room to avoid

the absurd hypothetical results trotted out by petitioners and their amici. Congress did not require costly expenditures to achieve truly *de minimis* benefits.

ARGUMENT

The Evironmental Amici disagree with the bulk of the arguments presented by the Solicitor General, petitioner UWAG, petitioner Entergy, and their amici. However, while the arguments presented by the Solicitor General, UWAG, and most of the amici are largely limited to advancing an erroneous interpretation of section 316(b), Entergy and two amici ask the Court to engage in a far more dangerous overreaching that would undermine not only the regulation of cooling water intake at issue in this case, but also the regulation of a wide variety of potentially deadly pollutants.

The Solicitor General acknowledges *National Crushed Stone* and "[a]ssum[es] for the sake of argument that cost-benefit analysis is not one of the other factors that EPA may consider in determining BAT." EPA Br. 24. According to the Solicitor General, however, this Court may nevertheless conclude that a cost-benefit analysis is permissible under section 316(b), because section 316 "governs the *intake* of water, as opposed to the *discharge* of pollutants," and pollutants are a more serious problem. *Id.* at 23. The Solicitor General also contrasts the description of the BTA standard in section 316(b) (which runs 46 words) with the statutory descriptions of the BPT, BCT, BAT, and BADT standards (which run longer).[8] On the basis of

[8] Of course, the relative brevity of statutory language does not

these distinctions, the Solicitor General maintains that EPA has broad discretion to determine whether (and, presumably, how) to employ cost-benefit analysis in setting BTA standards. *See* EPA Br. 20-23. Like the Solicitor General, UWAG does not disown Entergy's argument concerning the BAT and BADT standards. *See* UWAG Br. 14 (asserting that section 306 authorizes EPA to weigh costs and benefits). But it emphasizes what it calls "the material differences between § 316(b) and the other provisions." *Id.* at 46.

While Entergy embraces those arguments, it also advances the more far-reaching argument that EPA should be allowed to conduct cost-benefit analyses even under the BAT and BADT standards. *See* Entergy Br. 38-42. Essentially, Entergy argues that if sections 301 and 306 were rewritten by the Court to allow cost-benefit analysis, then EPA could likewise conduct such analyses under section 316(b), even if the Court finds the BTA standard more linguistically similar to the BAT and BADT standards than to the BPT and BCT standards. Entergy's argument is incorrect and would undermine the "national goal" of the Clean Water Act – *eliminating* the discharge of pollutants into the

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prevent it from expressing Congress's intention. *See, e.g., Whitman v. American Trucking Ass'ns*, 531 U.S. 457, 465-69 (2001) (rejecting, based largely on clear meaning of terms "public health," "adequate margin," and "requisite," industry's interpretation of 60-word provision in Clean Air Act setting forth requirements for national primary ambient air quality standards); *City of Chicago v. Environmental Defense Fund*, 511 U.S. 328, 339 (1994) (rejecting, based largely on provision's use of term "facility" instead of "wastestream," EPA's interpretation of household hazardous waste exemption in RCRA).

navigable waters of the United States. *See* Section 101(a)(1).

I. EPA IS NOT PERMITTED TO CONDUCT A COST-BENEFIT ANALYSIS TO ESTABLISH BAT AND BADT STANDARDS.

Entergy's contention that EPA may conduct a cost-benefit analysis in establishing BAT and BADT standards would lead to serious environmental harm. Entergy and its amici seek to expand this case involving harm to aquatic animals resulting from water intake by existing facilities – a serious environmental problem in its own right – to rewrite settled law governing pollution involving toxic chemicals and new facilities.[9] Their arguments in support of that position are entirely without merit.

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[9] As discussed below, the majority of pollutants subject to section 301's BAT standard are toxic pollutants, many of which can cause disease or death in humans at relatively low levels. In attempting to downplay the harm caused by intake structures, however, the Solicitor General and petitioners wrongly suggest that Congress considered impacts on wildlife to be comparatively unimportant. In drafting the CWA, Congress made protection of fish and other aquatic life a clear national priority. Not only does the Act establish the goal of achieving water quality levels that provide "for the protection and propagation of fish, shellfish, and wildlife," but it defines "toxic pollutant" as one that, *inter alia*, causes "death ... or physical deformations" to "any organism." Sections 101(a)(2) and 502(13). Cooling water intake structures (though they do not discharge pollutants) kill and maim fish and other aquatic animals on a daily basis.

A. The Statutory Provisions Governing BAT And BADT Do Not Permit The Use Of Cost-Benefit Analysis.

As the D.C. Circuit explained in 1978, Congress did not apply the "optimal pollution theory" when enacting the Clean Water Act. *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1041 n.41 (D.C. Cir. 1978). That theory "contends that there is a level or type of pollution that, while technologically capable of being controlled, is uneconomic to treat because the benefit from treatment is small and the cost of treatment is large." *Id.* If Congress had been using the optimal pollution theory, it would have required EPA to use a strict cost-benefit analysis to set all standards under the Act because cost-benefit analysis targets an "optimal" level of pollution.[10]

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[10] Petitioners and several of their amici assert that cost-benefit analysis is the equivalent of "common sense," and note that people use it for household decisions such as buying a car. But establishing regulatory policy is not like buying a car, and cost-benefit analysis often is a difficult tool to apply to environmental standard-setting. *See* Nicholas A. Ashford & Charles C. Caldart, *The Use of Cost-Benefit Analysis as a Means of Evaluating and Designing Options for Environmental Regulation*, in *Environmental Law, Policy, and Economics* 147-69 (MIT Press 2008) (cost-benefit analysis tends to undervalue benefits, understate impacts on future generations, overvalue costs, and ignore potential for technological change). The D.C. Circuit noted in *Weyerhauser* that the optimal pollution theory is "premised on a view that we have both adequate information about the effects of pollution to set an optimal level, and adequate political and administrative flexibility to keep polluters at that level once we allow any pollution to go untreated," and concluded that Congress doubted the validity of those premises. 590 F.2d at 1041 n.41. Distinguished scholars argued in the 1970s (and continue to argue today) that reliance on quantitative analysis tends to "squeez[e] out 'soft' but crucial information merely because it seems difficult to render commensurable with the 'hard' data in the problem." Laurence Tribe, *Ways Not to Think About Plastic Trees: New Foundations*

Congress rejected the optimal pollution theory in favor of establishing the ambitious national goal that "the discharge of pollutants into the navigable waters be eliminated" in order "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Sections 101(a) and (a)(1). Congress enacted "stiff penalties to force each industry ... to develop the technology necessary to achieve the Act's aspiring goal." *Weyerhaeuser*, 590 F.2d at 1025. In doing so, "Congress foresaw and accepted the economic hardship, including the closing of some plants, that effluent limitations would cause." *National Crushed Stone*, 449 U.S. at 79.

Congress also anticipated – correctly, as it turns out – that the Act's strict requirements would create a strong economic incentive for industry to develop newer, cleaner technology. *See NRDC v. EPA*, 859 F.2d 156, 208-09 (D.C. Cir. 1988) (in drafting Clean Water Act, Congress had "firm conviction of need for technology-forcing measures"). To this end, the Act's technology-based standards have largely been written as performance standards; they establish a goal on the basis of what is deemed attainable

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for Environmental Law, 83 Yale L.J. 1315, 1318-19 & n.25 (1974); Lisa Heinzerling, *The Clean Air Act and the Constitution*, 20 St. Louis U. Pub. L. Rev. 121, 149 (2001) ("Cost-benefit analysis tends to underrate those things that cannot be so quantified and monetized.") Thoughtful proponents of cost-benefit analysis recognize these problems. Robert W. Hahn & Cass R. Sunstein, *A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-Benefit Analysis*, 150 U. Pa. L. Rev. 1489, 1499-1500 (2002) ("Of course, it is possible that in practice, quantitative cost-benefit analysis will have excessive influence on government decisions, drowning out 'soft variables.'").

through the application of a particular technology, but they do not require the use of that technology. The regulated entity thus remains free to develop and employ a more efficient technology that attains (or exceeds) the goal at a lower cost.

1. The Statutory Language Describing The BAT And BADT Standards Disallows A Cost-Benefit Approach.

Consistent with Congress's overriding goal of eliminating the discharge of pollutants, the language of the BAT and BADT standards rejects cost-benefit analysis. The BAT standard for existing sources requires "the best available technology economically achievable for [a] category or class [of facilities], which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants." Section 301(b)(2)(A). At the same time, Congress did not ignore costs – it directed EPA, in establishing BAT standards, to include "the cost of achieving such effluent reduction" among the factors to be considered. Section 304(b)(2)(B). A straightforward reading of the BAT standard thus demonstrates that it is to be established with reference to the use of the available technology that *best* reduces or eliminates the discharge of pollutants, so long as that goal is "economically achievable." The language Congress adopted cannot reasonably bear a reading permitting the use of a cost-benefit analysis because such an analysis would result in a retreat from "the national goal of eliminating the discharge of all pollutants." Plainly, Congress did not give EPA authority to use cost-benefit considerations to override its determination to eliminate the discharge of pollutants when

technology is available to do so at a cost the industry can bear. Any doubt on this question is dispelled by section 301(b)(2)(A), which requires EPA to set the BAT standard at zero – "the elimination of all discharges of all pollutants" – where "such elimination is technologically and economically achievable." This is the language of feasibility, not cost-benefit.

The BADT standard for new sources[11] similarly mandates "the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants." Section 306(a)(1). As with the BAT standard, Congress directed EPA to consider a number of factors including "the cost of achieving such effluent reduction," but did not call for any comparison of costs with benefits. Section 304(b)(2)(B). A straightforward reading of the language of the BADT standard shows that, as with the BAT standard, Congress directed EPA to require that discharges be reduced to the level achieved by the available technology that is best at reducing or eliminating the discharge of pollution, provided the industry can afford it.[12] The language of the statute

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[11] Generally speaking, a "new source" is one that is constructed after the relevant new source standard has been promulgated. Section 306(a)(2).

[12] In practice, the BADT standards will tend to be more stringent than the BAT standards, for two reasons. First, the cost of utilizing particular technologies may be higher at existing plants than at new plants, because of the need to retrofit. Second, individual firms are authorized to seek certain variances from the BAT standards, while no such variance is

does not authorize EPA to invoke cost-benefit analysis to conclude that it is preferable to permit the discharge of a pollutant even though technology is available to prevent such discharge at a price the industry can bear.

This Court's decision in *Whitman* is instructive. The Clean Air Act ("CAA") provision at issue there, section 109(b), 42 U.S.C. § 7409(b), requires EPA to set ambient air quality standards at a level "requisite to protect the public health" with "an adequate margin of safety." Regulated entities argued that these terms could be read to allow EPA to consider implementation costs in setting such standards. In rejecting this argument, the Court found it salient that other provisions in the CAA "explicitly permitted or required economic costs to be taken into account in implementing the air quality standards," and concluded that it could not reasonably read into the statute "an authorization to consider costs that has elsewhere, and so often, been expressly granted." 531 U.S. at 471. Thus, the Court concluded, "[t]he text of § 109(b), interpreted in its statutory and historical context and with appreciation for its importance in the CAA as a whole, unambiguously bars cost considerations." *Id.* at 471.

Whitman is not an outlier case involving a "presumption" against considering costs, EPA Br. 33, or a case pertaining only to *whether*, but not *how*, costs may be considered, *see id.*[13] Nor is its reasoning

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available from the BADT standards. *See du Pont*, 430 U.S. at 137-39.

[13] Contrary to the Solicitor General's assertion, cost-benefit analysis is not a "form" or "manner" of cost consideration. EPA

limited to the precise language of CAA section 109(b). *See* Entergy Br. 28. Rather, *Whitman* is a straightforward exercise in reading a statutory provision carefully, mindful of the context in which it sits, and determining what Congress wanted. The resulting analysis applies with equal force to the Clean Water Act's BAT and BADT provisions.

Congress specified in CWA sections 304(b)(2)(B) and 306(b) that "the cost of achieving such effluent reduction" should be considered in setting BAT and BADT standards. Had Congress wanted EPA to compare costs with benefits in setting these standards, it would have said so, as it did twice elsewhere in section 304. *See* Sections 304(b)(1)(B) (directing EPA to consider "the total cost" of pollution reduction technology "in relation to the effluent reduction benefits" of such technology when setting BPT standards) and 304(b)(4)(B) (directing EPA to consider "the reasonableness of the relationship" between costs and effluent reduction benefits in setting BCT standards). Moreover, the CWA's technology-based standards, like the air quality standards at issue in *Whitman*, are "the engine that drives" the Act. 531 U.S. at 468. In such

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Br. 33. It is a different inquiry altogether. *See Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 936 (5th Cir. 1998) (*cited at* EPA Br. 39, Entergy Br. 42) ("The benefit to be achieved from adopting a particular pollution control technology is not an element of that technology's cost. ... Reinjection technology, for example, costs the same regardless of whether it reduces pollutant discharge by three million pounds per year or three pounds per year."). Entergy similarly conflates these concepts in trying to explain away this Court's holding in *Whitman*. *See* Entergy Br. 28 (noting that other provisions in the CAA allow EPA to "consider costs ... even though those provisions did not expressly provide for cost-benefit analysis").

instances, one would think that Congress was especially deliberate in choosing its words.

Nonetheless, Entergy points to the residual clause in section 304(b)(2)(B), which permits EPA to consider "such other factors as the Administrator deems appropriate" in setting BAT standards. Entergy Br. 39-40.[14] But this residual discretion does not permit the agency to interpose cost-benefit analysis – or any other policy metric of its choosing – in derogation of the choices already made by Congress. Section 304(b)(2)(B)'s residual clause is necessarily cabined by that subsection's list of "such" factors that EPA "shall" consider – namely, "the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, [and] non-water quality environmental impact (including energy requirements)." The specification of treatment "cost" (but *not* in relation to benefits), combined with the specification of "non-water quality" environmental impact (but *not* water quality impact), indicates that Congress did not intend EPA to weigh treatment costs against water quality benefits in setting BAT standards. Surely, Congress did not intend the general language of the residual clause to override the more specific terms that precede it, especially in a way that would undermine the congressional policy apparent in the use of those terms.

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[14] Other industry amici join in this argument, *see* ACC Br. 22-23, although the Solicitor General stops short of embracing it, *see* EPA Br. 24.

This Court construed a strikingly similar statutory provision in *Hughey v. United States*, 495 U.S. 411 (1990). The question in *Hughey* was whether the Victim and Witness Protection Act of 1982 allowed a court to award restitution for acts other than those underlying a criminal sentence, where the statute provided that the sentencing court "*shall* consider the amount of the loss sustained by any victim as a result of the offense, the financial resources of the defendant, the financial needs and earning ability of the defendant and the defendant's dependents, and *such other factors as the court deems appropriate.*" *Id.* at 416-17, *quoting* 18 U.S.C. § 3580(a) (1982 ed.) (emphases added). Focusing on "the language of the statute itself," *id.* at 415, the Court determined that the explicit reference to "the offense" precluded a reading of the residual clause that would allow a sentencing judge to look beyond that offense in awarding restitution. *See id.* at 418 ("[H]ad Congress intended to permit a victim to recover for losses stemming from all conduct attributable to the defendant, ... Congress would likely have chosen language other than 'the offense' ..."). [15] Furthermore, the Court held, since the enumerated items preceding the catchall phrase were designed to limit the scope of any restitution order, the canon of *ejusdem generis* required that the residual phrase not be read to expand a defendant's liability. *See id.* at 418-19. Accordingly, the Court "reject[ed] as implausible the Government's contention that the 'such other' language in § 3580(a)'s catchall phrase imports into the restitution

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[15] The Court made clear that its analysis was not based on the principle of lenity extended in criminal cases. *See Id.* at 422.

provisions a wholly new substantive dimension not otherwise evident in the statute." *Id.* at 420.

Entergy's suggestion that the residual clause of section 304(b)(2)(B) be read expansively fails along the same lines. That clause may not be read to obliterate the explicit limitations articulated in the terms immediately preceding it. Rather, the residual clause is an interstitial provision designed to give EPA leeway to consider "such other" (*i.e.*, similar) factors as those enumerated. It certainly may not be read as an invitation to countermand a substantive legislative choice as to the proper risk management tool in favor of the agency's own policy preferences, for "Congress ... does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions." *Whitman*, 531 U.S. at 468. In arguing to the contrary, Entergy seeks to pull the proverbial "elephant[]" out of a "mousehole[]." *Id.* Moreover, as discussed below, permitting EPA to conduct a cost-benefit analysis in setting BAT standards would not only override Congress's determinations but also this Court's authoritative construction of the statute in *National Crushed Stone*.

2. The Structure Of The Relevant Statutory Provisions Demonstrates That The BAT And BADT Standards Are Not To Be Based On Cost-Benefit Analysis.

Like the statutory language of these provisions, the structure of the statute confirms that the BAT and BADT standards do not permit the use of a cost-benefit analysis. It is undisputed that the BAT and BADT standards are intended to be more

environmentally protective than the BPT or BCT standards. The BPT standard is more relaxed because it is largely an interim standard designed to ensure initial progress toward achievement of the ultimate elimination of pollutants required by the BAT standard. The BCT standard, added in 1977, is more relaxed because it governs only a small subset of five "conventional" pollutants – so named because they can be treated by long-available (conventional) pollution control technology – whose wholesale elimination generally is not necessary to ensure water quality.[16] The more stringent BAT standard governs the bulk of the other pollutants discharged from existing sources, including 129 chemical compounds designated as "toxic" pollutants and a host of other pollutants designated as neither "toxic" nor "conventional."[17] *See* Sections 301(b)(2)(A), (C),

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[16] The designated "conventional pollutants" (*see* Section 304(a)(4)) are not specific pollutants so much as they are aquatic *conditions* that tend to vary with the level and nature of pollution discharges. Three of the four specifically named in the statute – biological oxygen demand, total suspended solids, and pH – can be affected by a wide variety of pollutants (many of which may be separately regulated as toxic or nonconventional), and the fourth, fecal coliform, encompasses a variety of different bacteria. (EPA has since added oil and grease – another broad category – to the list.) In setting BCT standards, EPA is directed to "compare the cost and level of reduction of such pollutants" attainable by the subject industrial category with that attainable by public sewage treatment plants (as these have traditionally been the primary pollutants that such plants are designed to treat). Section 304(b)(4)(B).

[17] Although EPA and its amici contend, to varying degrees of emphasis, that BAT applies only to a small subset of highly toxic chemicals that may harm humans, this characterization is strikingly inaccurate. First, 65 chemicals (comprising 129 chemical compounds) have been designated as toxic pollutants. *See* 40 C.F.R. § 401.15. Second, as noted above, the list is not limited to chemicals that are dangerous to humans; "toxic pollutant" is defined as a substance exerting a toxic effect on

(D), & (F). The BADT standard is the most demanding because it applies to new sources of pollution, which do not face the retrofitting problems encountered at existing sources.

In short, the structure of the Act plainly requires that the BAT and BADT standards be given a more environmentally protective meaning than the BPT and BCT standards. The BPT and BCT standards direct EPA to compare costs and benefits. The BAT and BADT standards do not. The obvious conclusion is that Congress intended EPA to perform a (limited) cost-benefit analysis under the BPT and BCT standards but not under the BAT and BADT standards.

B. This Court's Decision In *National Crushed Stone* Confirms The Conclusion That The BAT And BADT Standards Do Not Permit The Use Of Cost-Benefit Analysis.

As the Second Circuit concluded, this Court's decision in *National Crushed Stone* confirms that the BAT standard does not permit the use of a cost-benefit analysis. The issue in that case was whether EPA must consider "the economic capability of an individual discharger" when deciding whether to issue a variance from the BPT requirements. 449 U.S. at 72. The Court examined "the basic structure

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"any organism." Section 502(13). Third, while an individual discharger is authorized to apply for a relaxation of the BAT standard for certain "nonconventional" (and nontoxic) pollutants, *see* Section 301(g), the BAT standard remains the presumptively applicable standard for the class of nonconventional pollutants, *see* Sections 301(b)(2)(A) & (F).

of the Act" in holding that EPA is not required to consider individual economic capability. *Id.* at 69.

The Court relied heavily on a key structural aspect of the Act – that BPT imposes less stringent requirements than BAT. Specifically, the Court wrote that, unlike BAT, "BPT limitations do not require an industrial category to commit the maximum economic resources possible to pollution control, even if affordable." *Id.* at 75. As noted previously, the Court concluded that the BPT standard required what Senator Muskie called a "'limited cost-benefit analysis,'" one that examined only whether costs are "'wholly out of proportion'" to the marginal level of pollution reduction attained. *Id.* at 71 n.10, *quoting* 118 Cong. Rec. 33,696. However, under the stricter BAT standard, the Court stated, "total cost is no longer to be considered in comparison to effluent reduction benefits." 449 U.S. at 71. A cost-benefit analysis cannot be conducted without costs being "considered in comparison to" benefits.

Despite the clarity of this language, and of the logic on which it is based, Entergy argues that *National Crushed Stone* stands for the proposition that EPA is free to use cost-benefit analysis to set the BAT standards. Entergy Br. 42. Entergy bases this contention on the Court's statement that "the BAT provision 'lists "cost" as a factor to consider in assessing BAT, although it does not state that costs shall be considered in relation to effluent reduction.'" *Id.* at 42, *quoting* 449 U.S. at 71 n.10. "In other words," Entergy opines, "Congress made cost-benefit analysis *mandatory* for BPT but only optional for BAT." *Id.* at 42. These are not simply "other words" –

they are words with a fundamentally different meaning, and they cannot be squared with this Court's opinion.

The Court in *National Crushed Stone* recognized that the BAT standard, which requires industry to commit the maximum economic resources possible to pollution control, is more protective than BPT. It credited Senator Muskie's statement that Congress intended a limited cost-benefit analysis under the BPT standard. And it concluded that Congress intended there to be no comparison of costs to benefits under the BAT standard. Entergy's suggestion that EPA may nonetheless conduct a cost-benefit analysis to determine BAT standards contravenes this Court's understanding of the structure of the Act. BAT standards would be no more protective than the corresponding BPT standards if EPA used a cost-benefit analysis to determine BAT standards. And they would be even less protective if EPA conducted a strict cost-benefit analysis to set BAT standards, as Entergy argues it may, rather than the limited cost-benefit analysis applicable under the BPT standard.

This Court authoritatively construed the BAT standard in *National Crushed Stone* and concluded that it does not permit the comparison of costs and benefits required to conduct a cost-benefit analysis. The Court's recognition of cost as a factor to be considered under the BAT standard means what the Second Circuit concluded it means – that cost must be considered, but not as part of a cost-benefit analysis.

Entergy also attempts to dismiss *National Crushed Stone* as a "pre-*Chevron*" case. Entergy Br.

41. *See generally Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837 (1984). But the Court in *National Crushed Stone* determined that *Congress* had addressed how EPA is to consider costs in setting the BPT and BAT standards. Its conclusion that the BAT standard prohibits a comparison of costs and benefits leaves no gap in the statutory language for EPA to purport to fill by requiring a cost-benefit analysis. In *Chevron* terms, Congress has spoken to the issue – the statutory language leaves no room for an agency "interpretation" allowing cost-benefit analysis.[18]

The other cases cited by Entergy do not support a retreat from *National Crushed Stone*. Entergy relies on a Sixth Circuit decision, *BP Exploration & Oil, Inc. v EPA*, 66 F.3d 784 (1995), Entergy Br. 41, but the Sixth Circuit plainly erred. It based its conclusion that EPA may conduct a cost-benefit analysis in setting BAT standards on Senator Muskie's statement that Congress established a "'limited' balancing test," 66 F.3d at 79€, a statement that was made with respect to the BPT standard, not the BAT standard. As this Court held in *National*

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[18] The Solicitor General appears to suggest that a statute should be considered "silent" or "ambiguous" on a topic if it does not address that topic *in so many words*. EPA Br. 12 The function of the *Chevron* inquiry, however, is to determine the meaning of the words Congress *does* use. This Court has made clear that, under the first step of the *Chevron* analysis, it is important to review statutory language in context and not in isolation. *See, e.g., NAHB v. Defenders of Wildlife*, 127 S. Ct. 2518, 2534 (2007) ("[i]t is a fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the overall statutory scheme" (quotation marks omitted)). In *National Crushed Stone* the Court did just that, examining "the basic structure of the Act" to conclude that the BPT standard requires a cost-benefit analysis and the BAT standard does not permit one. 449 U.S. at 69.

Crushed Stone, the BAT standard is more environmentally protective than the BPT standard and does not call for a comparison of costs and benefits, but instead for the achievement of the goals established by Congress.[19]

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[19] In a footnote, Entergy cites a handful of decisions from lower courts in support of the statement that "no court has ever held that [a cost-benefit] analysis is forbidden" in setting BAT standards. Entergy Br. 41 & n. 18. To the contrary, in one of those cases the court rejected an industry petitioner's argument that certain BAT regulations were faulty because of EPA's failure to weigh costs against benefits, noting that "[t]he conspicuous absence of the comparative language contained in section 304(b)(1)(B) leads us to the conclusion that Congress did not intend the Agency or this court to engage in marginal cost-benefit comparisons" in setting BAT standards. *Association of Pacific Fisheries v. EPA*, 615 F.2d 794, 818 (9th Cir. 1980). Although the court also noted later that the benefits of the regulations "justified the costs," it is clear that the court was simply confirming that the effluent reduction benefit was not *de minimis*. *See id.* (The *de minimis* principle is discussed more fully below.) In another of the cases Entergy cites, the court concluded that "Senator Muskie intended that the type of assessment [used in setting BAT standards] should be basically the same [as the BPT determination], *except that there should be no cost-benefit analysis*." *American Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1051 (3d Cir. 1975) (emphasis added). No court has squarely held, after this Court's decision in *National Crushed Stone*, that EPA is permitted to conduct a cost-benefit analysis in setting BAT or BADT standards, other than the Sixth Circuit in the flawed *BP Exploration* decision. And while, as Entergy notes, the Fifth Circuit upheld a BAT standard against an industry challenge to the manner in which EPA had weighed pollution reduction benefits against costs, the court concluded that this cost-benefit exercise had been irrelevant to the BAT determination. *See Texas Oil*, 161 F.3d at 936 ("Whatever value such benefit estimates may have, they are not a required part of the BAT determination."). If the court had viewed this as a *permissible* exercise in setting BAT standards, surely it would have evaluated the substance of the agency's cost-benefit comparison in response to industry's "arbitrary or capricious" challenge.

As did the Sixth Circuit in *BP Exploration*, Entergy also relies on the D.C. Circuit's decision in *Weyerhauser*. *See* Entergy Br. 39-40. That case, which includes a thoughtful discussion of the legislative history of the 1972 Act, offers no solace to Entergy. As discussed above, the *Weyerhauser* court observed that Congress had *rejected* the "optimum pollution" theory and its reliance on cost-benefit analysis. Thus, while the interim BPT standard requires a limited balancing of costs and benefits, in the more stringent BAT standard "[a]ll factors, including costs and benefits, are consideration factors, and no factors are separated out for comparison." *Weyerhauser*, 590 F.2d at 1045.

When the *Weyerhauser* court speaks here of "benefits," it refers not to the *in-stream water quality* benefits of applying such technology (as Entergy would have it), but simply to the degree of pollutant reduction attained (*i.e.*, how well the technology *works*). *See id.* at 1044 n.49 ("The phrase 'effluent reduction benefits' avoids any suggestion that receiving water quality is an issue. Effluent reduction occurs whenever less effluent is discharged ... and the same degree of reduction occurs whether the discharge is into a small stream or the Pacific Ocean."). In fact, the primary holding in *Weyerhauser* is that Congress "intended to exclude consideration of receiving water quality completely" in crafting the Act's technology-based standards.[20] *Id.* at 1053 n.68;

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[20] "In only *one limited instance, thermal pollution*, is receiving water capacity to be considered in relaxing [technology-based] standards, and the section allowing such consideration was drafted as *a clear exception*." *Id.* at 1043 (referencing CWA section 316(a) (emphases added)). It is telling that the *Weyerhauser* court did not include section 316(b) in this statement.

id. at 1041-44 (EPA, in setting BPT standards, is *forbidden* from considering water quality benefits).[21] Further, as the D.C. Circuit noted, in 1977 Congress specifically considered whether to "rewrite" the BAT requirement "in order to continue the cost-benefit balancing" done under BPT, but decided instead to retain the original formulation, under which BAT does not include cost-benefit balancing. *Id.* at 1046.[22] Indeed, as Senator Muskie noted at the time, Congress added the BCT standard to the Act in 1977, thus permitting a cost-benefit balancing for designated conventional pollutants, precisely because the BAT standard is "not subject to ... any form of cost-benefit analysis." 3 Legislative History of the Clean Water Act of 1977, at 427 (1975).[23]

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[21] This answers UWAG's assertion that "until *Riverkeeper II*, no court had suggested that Congress intended to bar EPA from considering water quality in setting discharge controls." UWAG Br. 46. Of course, a source is ultimately required to meet a discharge limit *more stringent* than the applicable technology-based standard if that is necessary to attain in-stream water quality standards. *See* Section 301(b)(1)(C).

[22] To the extent that any loose language in *Weyerhauser* might be read to suggest in *dicta* that EPA may perform a cost-benefit analysis in establishing BAT standards, such statements must give way to this Court's later authoritative analysis in *National Crushed Stone*.

[23] ACC cites several additional cases for the proposition that BAT allows a full cost-benefit analysis, ACC Br. 22-23, but none supports this position. Two of those cases, *Chemical Mfrs. Ass'n*, 870 F.2d at 204, 207, and *Our Children's Earth Found. v. EPA*, 527 F.3d 842, 849 n.5 (9th Cir. 2008), involved the BPT (not BAT) standard, under which (as all parties agree) a certain form of balancing costs and benefits is allowed. Three others, *American Petroleum Inst. v. EPA*, 787 F.2d 965, 972 (5th Cir. 1986), *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 194 n.22 (2d Cir. 2004), and *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 516 (2d Cir. 2005), involved an application of the *de minimis* principle and did not endorse the use of cost-benefit analysis in setting the BAT standard. The final case, *NRDC v. EPA*, 863

With regard to the BADT standard, all agree that it is to be at least as environmentally protective as the BAT standard. *See, e.g.*, Entergy Br. 40 n.16, *quoting American Iron*, 526 F.2d at 1059 (referring to "a 'virtually identical' structure for BADT standards under §306"). Accordingly, the reference to the "cost of achieving such effluent reduction" in section 306(b)(1)(B), like the similar reference to cost under the BAT standard, permits EPA to consider whether the industry can bear the costs at issue and whether less costly methods can produce essentially the same environmental results – but does not permit the use of a cost-benefit analysis.[24]

F.2d 1420 (9th Cir. 1988), says outright that "BAT should represent 'a commitment of the *maximum resources economically possible* to the ultimate goal of eliminating all polluting discharges,'" *id.* at 1426, *quoting National Crushed Stone*, 449 U.S. at 74) (emphasis added), and "'the *greatest attainable level* of effluent reduction which *could be achieved*,'" *id.* at 1431, *quoting NRDC v. EPA*, 822 F.2d 104, 115 n.12 (D.C. Cir. 1987) (emphasis added), which is the language of feasibility, not cost-benefit analysis.

[24] Entergy's reliance on *International Paper Co. v. Ouellette*, 479 U.S. 481 (1987), which involved the interplay between state nuisance law and the CWA, is misplaced. *See* Entergy Br. 40-41 n.17. The Court there determined that a "downstream" state's nuisance law may not be invoked to upset any "weighing of the costs and benefits" conducted in setting technology-based or water quality-based effluent limits in the source state's discharge permits. *See Ouellette*, 479 U.S. at 494-96 (citing Sections 304, 302). The Court did not hold, however, that every permit limit devolves from a cost-benefit analysis. Obviously, *Congress* "weighs costs and benefits" in a holistic sense when it specifies which technology-based standards should apply to certain classes of dischargers, even where the standards it chooses do not *themselves* involve a cost-benefit analysis. EPA's establishment of *some* technology-based and water-quality based effluent limits may involve a "weighing of costs and

II. THE SECTION 301 AND SECTION 306 STANDARDS (INCLUDING BTA REQUIREMENTS) ARE TO BE ESTABLISHED FOR CLASSES AND CATEGORIES OF DISCHARGERS.

Petitioners and some amici argue that section 316(b) should be implemented on a case-by-case basis rather than by means of categorical regulations. *See, e.g.*, Entergy Br. 46-47. Unquestionably, each facility has its own set of site-specific physical and technological characteristics, and each facility owner has its own set of financial capabilities and constraints. Congress thus could have directed EPA to set the Act's various technology-based limitations on a site-by-site basis. Instead, the CWA directs that the BAT, BCT, and BADT limitations be established for "categories" of point sources. Sections 301(b)(2)(A) & (b)(2)(E); 306(b)(1)(A) & (b)(1)(B). EPA took a similar categorical approach to the establishment of the BPT limitations, and the Court held in *du Pont* that this approach is consistent with the language, structure, and history of the statute. *See*, 430 U.S. at 129 ("In sum, the language of the statute supports the view

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benefits," but only where Congress has *explicitly* permitted this analysis (as it did for BPT and BCT, but not BAT or BADT). *See also* Section 302(b)(2)(A) (modification of EPA water-quality based effluent limit allowed where permittee shows "no reasonable relationship between the economic and social costs and the benefits to be obtained"). And a source state may permissibly "weigh costs and benefits" in setting permit terms based on state law, so long as those terms are *more stringent* than what federal law requires. *See* Section 510(1). (For this last reason, a state's application of its nuisance law against its own water pollution sources is *not* preempted by the CWA.)

that § 301 limitations are to be adopted by the Administrator, that they are to be based primarily on classes and categories, and that they are to take the form of regulations.").

Section 316(b) mandates that "[a]ny standard established pursuant to section 1311 of this title or section 1316 of this title [CWA sections 301 or 306] ... shall require" BTA for cooling water intake. In other words, the section 316(b) BTA requirements are to be established *as part of* the section 301 and section 306 standards, and thus are to be "based primarily on classes and categories," and to "take the form of regulations," as well. Indeed, in *du Pont* the Court relied, in part, on section 316(b)'s use of the term "'standard'" in holding that Congress intended EPA to promulgate categorical effluent limitations for existing sources under section 301. 430 U.S. at 133 n.24. The contention that section 316(b) must be implemented on a case-by-case basis thus cannot be squared either with the plain language of the statute or with this Court's analysis in *du Pont*.

Moreover, as the Court noted in *du Pont*, a case-by-case approach "would place an impossible burden on EPA," requiring the agency "to give individual consideration" to each of the numerous facilities to be regulated across the country, and would unseasonably delay the issuance of the required restrictions. 430 U.S. at 132-33. A case-by-case approach would also countermand the general congressional mandate to "'assure that similar point sources with similar characteristics ...will meet similar effluent limitations'" insofar as possible, both to prevent a 'race to the bottom' among states eager to attract business and as a matter of basic fairness.

NRDC v. Train, 510 F.2d 692, 709-10 (D.C. Cir. 1974) (quoting Senator Muskie). Thus, as noted by Senator Muskie in the debates over the 1972 Act, Congress chose "to avoid imposing on the Administrator any requirement to consider the location of sources within a category ... ." *Weyerhaeuser*, 590 F.2d at 1045 n.52 (citation omitted).

III. THERE IS AMPLE ROOM UNDER THE STATUTE FOR EPA TO AVOID TRULY ABSURD RESULTS.

Interspersed throughout the briefs of petitioners and their amici are variations of the following argument: if cost-benefit analysis is not used for regulatory decision-making, absurd policy results will ensue. The short answer to this argument, of course, is that the Constitution assigns Congress the job of policy-making, and Congress is free to select policy alternatives with which some or all of the parties to this case may vehemently disagree. Moreover, the Clean Water Act's technology-based standards do not leave industry (or the environment) prey to truly absurd results. As the Court noted in *du Pont*, the use of national categorical standards necessitates that variances be available for individual facilities at which the relevant technological features are fundamentally different from those on which the (technology-based) standards were established.[25] *See* 430 U.S. at 128. Further, delays in the implementation of the BAT and BCT standards are available for firms choosing

[25] EPA had promulgated such a variance for the BPT standard by regulation, and Congress has since added such a variance for the BCT and BAT standards. *See* Section 301(n).

to develop innovative technologies for meeting them, *see* Section 301(k), and firms may seek relaxation of the BAT standard for nonconventional pollutants on cost or water quality grounds, *see* Sections 301(c) & (g).

Finally, EPA need not require costly effluent reductions (or cooling water intake adjustments) where the real-world benefit will be no more than *de minimis*. *See, e.g., Association of Pacific Fisheries*, 615 F.2d at 818. However, this does not permit the agency to impose a cost-benefit framework in derogation of congressional policy. As the D.C. Circuit has noted:

> Unless Congress has been extraordinarily rigid, there is likely a basis for an implication of de minimis authority to provide exemption when the burdens of regulation yield a gain of trivial or no value. That implied authority is not available for a situation where the regulatory function does provide benefits, in the sense of furthering the regulatory objectives, but the agency concludes that the acknowledged benefits are exceeded by the costs. For such a situation any implied authority to make cost-benefit decisions must be based not on a general doctrine but on a fair reading of the specific statute, its aims and legislative history.

Alabama Power Co. v. Costle, 636 F.2d 323, 360-61 (D.C. Cir. 1979) (discussing the CAA).

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

CHARLES C. CALDART
JOSEPH J. MANN
NATIONAL ENVIRONMENTAL LAW CENTER
1402 Third Avenue, Suite 715
Seattle, WA 98101

CHRISTOPHER J. WRIGHT
Counsel of Record
TIMOTHY J. SIMEONE
S. ROBERTS CARTER III
HARRIS, WILTSHIRE & GRANNIS LLP
1200 18th Street, N.W.
Washington, DC 20036
(202) 730-1300

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AMICUS CURIAE BRIEF

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In the Supreme Court of the United States

ENTERGY CORPORATION, PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

PSEG FOSSIL LLC, ET AL., PETITIONERS

v.

RIVERKEEPER, INC., ET AL.

UTILITY WATER ACT GROUP, PETITIONER

v.

RIVERKEEPER, INC., ET AL.

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF OF ENVIRONMENTAL LAW PROFESSORS AS AMICI CURIAE IN SUPPORT OF RESPONDENTS

JAMES R. MAY
Widener University School of Law
4601 Concord Pike
Wilmington, DE 19803
(302) 477-2060

JARED A. GOLDSTEIN*
Roger Williams University School of Law
Bristol, RI 02809
(401) 254-4594

* Counsel of Record

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INTERESTS OF THE AMICI CURIAE[1]

Amici are professors and scholars who teach, research and write on environmental, natural resources, and energy law. Amici have an interest in seeing that the Court is informed on the appropriate role of costs in the implementation of § 316(b) of the Federal Water Pollution Control Act, 33 U.S.C. § 1326(b), commonly referred to as the Clean Water Act.

Amici are *William L. Andreen*, the Edgar L. Clarkson Professor of Law at the University of Alabama School of Law; *William Wade Buzbee*, Professor of Law at Emory Law School and Director of the Emory Environmental and Natural Resources Law Program; *Ann Carlson*, Professor of Law at UCLA School of Law and the Co-Director of the Frank G. Wells Environmental Law Clinic; *Kim Diana Connelly*, Associate Professor of Law, University of South Carolina School of Law; *Daniel Farber*, Sho Sato Professor of Law, Director, California Center for Environmental Law & Policy (CCELP) Co-Director, UCB Center for Catastrophic Risk Management, University of California, Berkeley; *Robert L. Glicksman*, Robert W. Wagstaff Professor of Law, University of Kansas; *Oliver A. Houck*,

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[1] The parties have consented to the filing of this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amici, their institutions, or their counsel made a monetary contribution to its preparation or submission.

Professor of Law, Tulane University Law School; *Jeffrey Miller*, Vice Dean for Academic Affairs and Professor of Law, Pace University School of Law; *Thomas O. McGarity*, Joe R. and Teresa Lozano Long Endowed Chair in Administrative Law, the University of Texas School of Law; *Robert V. Percival*, Robert F. Stanton Professor of Law, Director, Environmental Law Program, University of Maryland School of Law; *Sidney Shapiro*, Associate Dean for Research and Development and University Distinguished Chair in Law, Wake Forest School of Law; *Dan Tarlock*, Distinguished Professor of Law and Director of the Program in Environmental and Energy Law, Chicago-Kent College of Law; and *Wendy E. Wagner*, Joe A. Worsham Centennial Professor, the University of Texas School of Law.

Amici file this brief solely as individuals and not on behalf of the institutions with which they are affiliated.

SUMMARY OF ARGUMENT

In the Clean Water Act, Congress adopted as a national goal the restoration and maintenance of "the chemical, physical, and biological integrity of the Nation's waters," 33 U.S.C. § 1251, and chose technology-based standards as the central regulatory tools to achieve that goal. The technology-based approach marked a sharp break with the water quality-based approach that had governed until 1972, which predicated pollution control on assessments of how much harm pollution causes receiving waters and determinations of how much pollution it was reasonable to tolerate. Congress found this pre-1972 approach to be "inadequate in

every vital respect." While the water quality-based approach required complex scientific evaluations of the effects of pollution on receiving water and delicate policy determinations of how much pollution was tolerable in each water body, the technology-based approach adopted in the Clean Water Act is much simpler, requiring EPA to focus on the capacity of technology to reduce water pollution rather than on the harms caused by pollution or on making the policy determination of how much pollution it is economically reasonable to tolerate.

Although Section 316(b) of the Clean Water Act addresses cooling water intake rather than pollution discharges, it is otherwise typical of the Clean Water Act's technology-based standards. It directs EPA to set performance standards for cooling water intake structures that reflect the "best technology available for minimizing adverse environmental impact." EPA's task in applying that section involves identifying the "adverse environmental impacts" associated with cooling water intake; identifying the "available" cooling water intake technologies; and determining which of those technologies is "best . . . for minimizing" the identified impacts. By its plain terms, Section 316(b) requires EPA to set performance standards based on the capacity of available technology to minimize impacts like entrainment and impingement.

EPA's task in setting the standards required by Section 316(B) is little different than its task in setting technology-based standards for eliminating pollution discharges. Just as EPA must determine which technologies eliminate the most pollution, EPA must determine which technology minimizes impacts

like entrainment and impingement. In each case, Congress has directed EPA to focus on technological capacity rather than assessing how much environmental harm it is reasonable to tolerate.

Petitioners, however, mistakenly contend that EPA should set standards under Section 316(b) by attempting to balance the environmental benefits against the costs of doing so, and it should undertake this cost-benefit balancing on both a national and a site-specific basis. While this may or may not be a sensible policy suggestion, Congress adopted a very different policy when it enacted Section 316(b) of the Clean Water Act. Congress, not the EPA, has already weighed the costs and benefits and has concluded that it is worth the costs to have intake structures reflect the best available technology for minimizing adverse impacts. Although Petitioners frame their arguments in terms of statutory construction, they are actually mounting a direct attack on the technology-based regulatory approach Congress chose in the Clean Water Act. They effectively ask this Court to turn the clock back to 1971. Under petitioners' view, EPA can ignore the available technology that most reduces the adverse impacts associated with water intake, not because such technology is unaffordable, but because EPA has nearly unlimited discretion to decide that the benefits to water quality do not justify the costs. Yet this ambient-based approach reflects a policy that Congress repudiated in adopting Section 316(b).

Petitioners mistakenly argue that regulating cooling water intake structures without balancing costs and benefits would be irrational and would lead to absurd results. The history of water pollution

regulation before 1972 demonstrates that Congress wisely chose to adopt standards based on technological capacity rather than balancing costs and benefits. Experience under the Clean Water Act vindicates Congress's choice: the technology-based standards adopted under the Clean Water Act have produced significant environmental benefits without causing economic disruption or the absurd results Petitioners predict.

ARGUMENT

I. THE COST-BENEFIT BALANCING THAT PETITIONERS ADVOCATE IS FUNDAMENTALLY AT ODDS WITH THE CLEAN WATER ACT'S TECHNOLOGY-BASED APPROACH

Petitioners advocate a cost-benefit balancing approach to Section 316(b), under which EPA makes detailed assessments of the environmental harms caused by cooling water intake technologies and then compares the monetized benefits of avoiding those harms against the costs of the technologies. Whatever the merits of that regulatory approach, it is fundamentally inconsistent with the Clean Water Act. In enacting the Clean Water Act, Congress made a sharp break with previous regulatory efforts that predicated regulatory controls on a determination that industrial activities cause more harm to water quality than regulators considered reasonable. Congress concluded that assessment of environmental harm was a scientific morass that impeded effective regulation and that water quality was gravely threatened by giving regulators power to determine how much environmental harm is

reasonable. Cost-benefit balancing of the sort advocated by petitioners, in contrast, would return regulation to the pre-Clean Water Act era.

A. In the Clean Water Act, Congress Adopted Technology-Based Standards That Do Not Depend on Proof of Environmental Harm

The most fundamental change wrought by the Clean Water Act was Congress's decision to dispense with proof of environmental harm as a predicate to curtailing activities that affect our nation's waters. In common law nuisance actions, water pollution could only be enjoined if the plaintiffs made the very difficult showing that pollution caused demonstrable harms to specific water bodies.[3] Congress continued this common law approach when it first enacted federal water pollution law in the Water Pollution Control Act of 1948, Pub. L. No. 80-845. Under that Act and several subsequent ones, the federal and state governments sought to keep water pollution to acceptable levels by implementing site-specific water quality standards. These standards varied depending on each state's designated uses for particular water bodies—lakes and rivers designated for industrial use were governed by lower water quality standards than waters designated for fishing, swimming, and recreation, for example.[4]

Like cost-benefit balancing, the water quality approach was based on the assumption that pollution

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[3] *See, e.g.*, New York v. New Jersey, 256 U.S. 296, 311-12 (1921); Missouri v. Illinois, 200 U.S. 496, 517, 526 (1906).

[4] *See* Water Quality Act of 1965, Pub. L. No. 89-234, § 5(a), 79 Stat. 903, 908.

was acceptable "up to a point of unreasonableness." Rodgers, Environmental Law: Air and Water § 4.1 at 13 (2d ed. 1986). Under the water quality-based approach, regulatory controls could be imposed only based on proof that particular pollution discharges caused demonstrable environmental harms.[5] Regulators were required to assess the effects of a myriad of industrial pollutants on human health, fish, shellfish, and other aquatic organisms; to determine, based on the assessment of these effects, the acceptable concentrations of each pollutant, considering various uses of water bodies; and then assess for each industrial discharger whether its discharges contributed to pollution levels above the acceptable concentrations. *See* Houck, *supra* note 4, at 10,528. The water quality-based approach proved unworkable. Regulators could not determine with precision what pollutant thresholds were safe for human health and for aquatic life, or how to implement them. Water quality-based programs produced endless rounds of finger-pointing and little cleanup.[6]

When Congress enacted the Clean Water Act in 1972, it concluded that the water quality-based approach to pollution control had been a dismal

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[5] *See* Water Pollution Control Act of 1948 § 2(d)(1); Frank J. Barry, *The Evolution of the Enforcement Provisions of the Federal Water Pollution Control Act*, 68 Mich. L. Rev. 1103, 1105 (1970); Oliver A. Houck, *The Regulation of Toxic Pollutants Under the Clean Water Act*, 21 Envtl. L. Rep. 10,528 (1991).

[6] *See* Houck, supra note 4.

failure, indeed "inadequate in every vital aspect."[7] As this Court has explained, the failure "stemmed from the character of the standards themselves, which focused on the tolerable effects rather than the preventable causes of water pollution." EPA v. California, 426 U.S. 200, 202 (1976). The process for controlling pollution was far too cumbersome because it depended on evaluating whether pollution discharges caused environmental harms, an evaluation that was fraught with scientific uncertainties. *See id.* at 204 (describing the difficulties of "work[ing] backward from an overpolluted body of water to determine which point sources are responsible and which must be abated"). As Congress concluded, assessments of environmental harm were plagued with insolvable scientific uncertainties:

> We have seen a great deal of evidence indicating that this water quality standards system of regulation assumes more knowledge about our complex ecosystem than we actually have. . . . [T]he history of our water pollution control program suggests that State and Federal governments will continue to founder

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[7] *See* Weinberger v. Romero-B*arcelo*, 456 U.S. 305, 316 (1982) ("Congress passed the 1972 Amendments because it recognized that 'the national effort to abate and control water pollution has been inadequate in every vital aspect.'") (quoting Sen. Comm. Rpt., S. Rep. No. 92-414, p.7 (1971), *reprinted in* U.S. Code Cong. & Admin. News 3674); *EPA v. Cal.*, 426 U.S. at 202 (declaring that the federal "program based on water quality standards. . . proved ineffective").

> on the staggering complexity of this control system.[8]

The complexity of the regulatory task allowed polluters to exploit the scientific uncertainties to delay implementation of environmentally sound controls.[9]

In 1972 Congress sought to avoid saddling regulators with the impossible task and "staggering complexity" of assessing the environmental harms caused by industrial activities and determinations of the tolerable amounts of environmental harm, embarking instead on a novel technology-based approach. The Act replaced the federal goal of reducing water pollution to acceptable levels with "the national goal that the discharge of pollutants into the navigable waters be eliminated." 33 U.S.C. § 1251(a); *see also* EPA v. Nat'l Crushed Stone Assn., 449 U.S. 64, 69 (1980). To achieve the goal, Congress turned to the causes of water pollution and away from their effects, directing that EPA establish technology-based effluent limitations. These standards seek to eliminate all discharges if such elimination is "'technologically and economically achievable." E.I. du Pont de Nemours v. Train, 430 U.S 126 (1976).[10]

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[8] 1972 House Report, Legislative History of the Water Pollution Control Act Amendments of 1972, at 865. *See also* 1972 Leg. Hist. at 1304 (Sen. Cooper).

[9] *See* 1972 Leg. Hist. at 209 (statement of Sen. Tunney).

[10] Water quality standards remain operable under the Clean Water Act as a backup when uniform technology-based standards are insufficient to meet local water quality standards. *See* 33 U.S.C. § 1313; James R. May, *The Rise and*

The technology-based approach imposes increasingly stringent effluent limitations geared to technological capacity. See Train, 430 U.S. at 115 n.3 ("[A] discharger's performance is now measured against strict technology-based effluent limitations . . . to which it must conform, rather than against limitations derived from water quality standards to which it and other polluters must collectively conform."). Effluent limitations adopted in the Clean Water Act do not require any assessments of the environmental harms caused by pollution discharges.[11] Congress simply assumed that all water pollution is harmful and should be eliminated. The Clean Water Act therefore restricts pollution discharges based on the capacity of technology to do so and without any need for proof that discharges cause any environmental harm.[12]

Repose of Assimilation-Based Water Quality, Part I: TMDL Litigation, 34 Envt'l L. Rep. 10247 (Env. L. Inst. 2004).

[11] *See Train*, 430 U.S. at 115 n.3; Arkansas v. Oklahoma, 503 U.S. 91, 101 (1992).

[12] Congress employed a similar technology-based regulatory approach in the other major pollution control statutes, eschewing any requirement that proof of environmental harm be shown before pollution control measures were adopted. For instance, in the Clean Air Act of 1970, Pub. L. No. 91-604, 84 Stat. 1676, codified as amended at 42 U.S.C. § 7401-7671g, Congress established technology based standards on "major emitting facilities," ("best available control technology), 42 U.S.C. § 7449(3), "major stationary sources," ("lowest achievable emission rate"), 42 U.S.C. § 7501(3) and 7503(a)(2); and for "major sources" of hazardous emissions § 7412(d)(2) ("maximum degree of reduction ... achievable"). *See also* Resource Conservation and Recovery Act, Pub. L. No. 94-580, 90 Stat. 2795 (codified as amended

Rather than continue to predicate the protection of waters on what Senator Muskie described as the impossible "search for a precise link between pollution and water quality," the Act sets standards based on "the best control technology." For existing sources of water pollution, the first phase standard required that, by July 1977, polluters meet performance standards based on the "best practicable control technology currently available" (BPT). 33 U.S.C. 1311(b)(1)(A), *see* Pet. App. 97a. The second step was to require these dischargers to meet stringent performance standards for conventional pollutants based on "best conventional pollution control technology" (BCT), and for toxic and nonconventional pollutants based on the "best available technology economically achievable" (BAT). 33 U.S.C. § 1311(b)(2)(A), (E), *see* Pet. App. 97a. Rodgers, 2 Env. Law: Air and Water § 4.28 at 411. New sources were to be required to use the "best available demonstrated control technology, processes, operating methods, or other alternatives" (BADT). 33 U.S.C. § 1311(b)(1)(B), *see* Pet. App. 97a.

Because the promulgation of technology-based standards does not involve assessments of environmental harm, they are far easier to set and enforce, and much more efficient to administer, than other regulatory methods that aim to establish a link between pollution discharges and harm. *See* Wendy E. Wagner, The Triumph of Technology-Based Standards, 2000 U. Ill. L. Rev. 83, 94-107 (2000).

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at 42 U.S.C. §§ 6901-6992K) (requiring EPA to set technology-based standards for facilities that dispose hazardous wastes).

B. None of the Clean Water Act's Technology-Based Standards Allow Regulators to Undertake the Sort of Cost-Benefit Balancing That Petitioners Advocate

The enormously complex scientific and regulatory undertaking petitioners suggest for Section 316(b) would be anomalous within the context of the Clean Water Act because it would focus regulatory attention less on evaluation of technological capacity than on when it is reasonable to allow environmental harms. This is precisely the analysis Congress eschewed in enacting the Clean Water Act. As the D.C. Circuit has explained, the Clean Water Act does not embody the "optimal pollution theory" that "that there is a level or type of pollution that, while technologically capable of being controlled, is uneconomic to treat because the benefit from treatment is small and the cost of treatment is large."[14] Such a theory relies precisely on the premise rejected by Congress that regulators have "adequate information about the effects of pollution to set an optimal test, and adequate political and administrative flexibility to keep polluters at that level."[15]

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[14] Weyerhaeuser Co. v. Costle, 590 F.2d 1011, 1041 n.41 (D.C. Cir. 1978).

[15] *Id.*; *see also* City of Arcadia v. EPA, 411 F.3d 1103, 1105 (9th Cir. 2005) ("Technology-based regulations reduce levels of pollution by requiring a discharger to make equipment or process changes, without reference to the effect on the receiving water."); Am. Petroleum Inst. v. EPA, 858 F.2d 261, 265 (5th Cir. 1988) ("[T]he impact of a particular discharge upon the receiving water is not an issue to be considered in setting technology-based limitations.")

Petitioners attempt to paper over the anomaly that the technology-based standard in Section 316(b) depend both on site-specific assessments of water quality and determinations of how much environmental harm is reasonable by arguing that all of the Clean Water Act's technology-based standards actually allow for the sort of broad cost-benefit balancing they advocate for Section 316(b). Entergy Br. 38-42; UWAG Br. 35-37. Petitioners are wrong. None of the Clean Water Act's technology-based standards involve the sort of cost-benefit balancing they read into Section 316(b). As discussed above, Congress deliberately chose not to hold the protection of the nation's waters hostage to the resolution of insolvable scientific conundrums or determinations of when environmental harms are reasonable.

Only two of the Clean Water Act's technology-based standards—"best practicable control technology currently available" (BPT) and "best conventional pollutant control technology" (BCT), *see* 33 U.S.C. § 1314(b)(1)(B),(b)(4)(B)—call for even limited consideration of the relationship between costs and benefits, and those sections do not involve anything like the broad cost-benefit balancing petitioners read into Section 316(b).[16] The limited cost-benefit analysis

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[16] Even if petitioners were right that the BPT an BCT provisions authorize broad cost-benefit balancing, it would undermine rather than support their position because the express inclusion of language mandating cost-benefit comparisons in applying BPT and BCT, and the absence of such language in Section 316(b), can only be read to mean that Congress did not intend that standards under Section 316(b) would be based on cost-benefits comparisons. *See Keene* Corp. v. United States, 508 U.S. 200, 208 (1993)

set forth in BPT does not involve any assessment of environmental harms or a determination of when it is economically reasonable to accept such harms. Instead, EPA must "consider" "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." 33 U.S.C. § 1314(b)(1)(B). The courts have uniformly recognized that "effluent reduction benefits" refers simply to how much pollution a technology is capable of reducing and does not involve any considerations of water quality effects. As the D.C. Circuit succinctly stated, "Effluent reduction occurs whenever less effluent is discharged."[17] This reflects Congress's policy choice of directing EPA to focus on the causes of pollution, not the effects.[18]

What EPA does not do in setting performance standards using BPT and BCT, and what EPA was not authorized to do, is to attempt to assess the environmental harms that are caused by the discharge of pollutants and to determine whether the

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("When Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.").

[17] Weyerhaeuser Co. v. Costle, 590 F.2d 1011, 1044 n.49 (D.C. Cir. 1978); *see also* Appalachian Power Co. v. EPA, 671 F.2d 801, 809 n.3 (4th Cir. 1982).

[18] The same is true of Congress's directions for BCT, which instruct EPA to consider "the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived." 33 U.S.C. § 1314(b)(4)(B). As with BPT, the "benefits" side of the comparison used in setting BCT is the amount of pollution that can be reduced, not benefits to water quality.

environmental benefits of preventing those harms are worth the costs that would be imposed on polluters. Congress has already established the national goal of eliminating all water pollution, and EPA could not properly conclude that advancing toward that goal is not worth the costs. Accordingly, even when Congress expressly authorized consideration of the relationship between costs and benefits, Congress did not authorize EPA to do what petitioners argue EPA should do in setting standards under Section 316(b): assess whether a dollar spent on technology saves a dollar's worth of fish.[19]

The Clean Water Act's other technology-based standards provide even less support for the broad-ranging cost-benefit balancing petitioners advocate for Section 316(b). In setting effluent limitations based on the "best available technology economically achievable," or BAT, EPA is not directed to compare compliance costs with environmental benefits at all. Instead, Congress directed that effluent limitations under BAT "shall require the elimination of discharges of all pollutants" if "such elimination is technologically and economically achievable." 33 U.S.C. § 1311(b)(2)(A). By its terms, BAT mandates the maximum pollution reduction that is technologically and economically achievable.[20] In

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[19] *See* Rodgers, Environmental Law: Air and Water 432 (2d ed. 1986) (explaining that "cost-sensitive" standards such as BPT or BAT are far different than standards justified by formal, monetized cost-benefit analyses, where "every dollar spent on technology must return at least a dollar in enhanced water quality").

[20] *See* National Crushed Stone Ass'n, 449 U.S. at 74 (BAT "represents a commitment of the maximum resources

mandating BAT, Congress already undertook the relevant balancing when it declared the national goal of eliminating water pollution. Congress did not conclude that pollution should be limited up to the point when benefits outweigh costs; instead, in mandating BAT, Congress ordered that pollution should be eliminated to the maximum extent technologically and economically possible.[21]

In any event, this Court has already recognized that the BAT provision does not authorize cost-benefit balancing.[22] That conclusion, based on the plain text, structure, and goals of the Clean Water Act, is also fully supported by its legislative history. As Senator Muskie, the chief Senate sponsor of the Clean Water Act explained, "In making the determination of 'best available' for a category or

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economically possible to the ultimate goal of eliminating all polluting discharges.").

[21] Petitioners' claim that having EPA consider "such other factors as [it] deems appropriate" authorizes cost-benefit analysis for BAT is incorrect. Entergy Br. 9, 40. The word "such" is to be interpreted in accordance with the words it modifies, none of which suggest Congress has authorized EPA to engage in a cost-benefit analysis in setting BAT. See Environment America Br. Part I.

[22] *See* EPA v. National Crushed Stone Assn., 449 U.S. at 71 ("Similar directions are given the Administrator for determining effluent reductions attainable from the BAT except that in assessing BAT total cost is no longer to be considered in comparison to effluent reduction benefits."); Am. Textile Mfrs. Inst., Inc. v. Donovan, 452 U.S. 490, 510 n.30 (1981) (stating that, in contrast to the BPT determination, in making a BAT determination "the Administrator is directed to consider total cost, but not in comparison with effluent reduction benefits.").

class, the Administrator is expected to apply the same principles involved in making the determination of 'best practicable'... *except as to cost-benefit analysis.*"[23] Moreover, EPA's longstanding position and practice has been that BAT determinations do not involve cost-benefit balancing.[24]

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[23] Legislative History of the Water Pollution Control Act Amendments of 1972, 93rd Cong., 1st Sess., 170 (Comm. Print 1973) (emphasis added). Petitioners' attempts to counter Senator Muskie's remarks by quoting those of Representative Clausen ring hollow. Entergy Br. at 35. Representative Clausen's statement that Section 316(b) should be read as to allow BTA at an "economically practicable cost" is not inconsistent with Muskie's position that the "linguistically similar" BAT does not require a "cost-benefit analysis." The lower court's "cost feasibility" approach seems in concert with Representative Clausen's view of the role of costs in construing Section 316(b). To the extent the comments appear to be inconsistent, the view of Senator Muskie—a principal Senate sponsor of the Clean Water Act—have long been read as authoritative. *See, e.g., Train*, 430 U.S. at 129; *National Crushed Stone Assn.*, 449 U.S. at 71 n.10.

[24] In the last thirty-five years, although EPA has established hundreds of effluent limitations using BAT, *see* http://www.epa.gov/waterscience/guide/industry.html, EPA has not set BAT performance standards based on cost-benefit analysis and has repeatedly resisted demands by industry to do so. *See, e.g.*, Texas Oil & Gas Ass'n v. EPA, 161 F.3d 923, 936 (5th Cir. 1998) (agreeing with EPA that it could set BAT without undertaking cost-benefit analysis); Rybachek v. EPA, 904 F.2d 1276, 1290-91 (9th Cir. 1990) (same). To be sure, EPA has complied with Executive Order 12,291 (February 17, 1981) and its successors, which require agencies to undertake cost-benefit analysis and submit them to the

Thus, contrary to petitioners' suggestions, the Clean Water Act's technology-based standards authorize neither assessment of environmental harms nor comparison of the benefits of avoiding those harms against the costs of doing so. To authorize EPA to conduct such wide-ranging cost-benefit balancing under Section 316(b) would be contrary to the technology-based regulatory approach adopted in the Clean Water Act.

C. The Clean Water Act's Technology-Based Regulatory Approach Has Dramatically Improved Water Quality Without Producing Absurd Results

Petitioners and their amici warn gravely that absurd results are sure to follow if EPA sets standards for intake structures without balancing costs and benefits. EPA will have no choice, petitioners claim, but to require industry to adopt cripplingly expensive technology with little or no environmental benefits. See, e.g., Entergy Br. at 50-51; API Br. at 4. If respondents prevail, petitioners warn, EPA would require industry to incur "massive technology costs" in a misguided attempt to save every fish. Entergy Br. at 50. Indeed, EPA would be compelled to tell a powerplant operating on the Great Salt Lake to spend untold millions of dollars to protect nonexistent fish. Entergy Br. at 50.

Office of Management and Budget before issuing significant regulations, but those executive orders do not (and could not) change the *substance* of the statutory standards set by Congress.

The zeal of petitioners and their amici for cost-benefit analysis knows no bounds, as they claim that virtually every known calamity will occur if EPA determines the "best technology available" without balancing compliance costs against environmental benefits. Petitioners and their amici apparently are not joking when they claim that the failure to weigh costs and benefits under Section 316(b) will cause "massive impacts" on the American economy," API Br. 19; exacerbate climate change, NEI Br. 3-6, 22; cause "substantial uncertainty under every regulatory statute," API 23; "destroy the ability of regulatory agencies to regulate," API 29; cripple the nation's energy supply by shutting down untold baseload fossil fuel fired and nuclear power plants, Entergy Br. 3, NEI Br. 19, and oil refineries and platforms, API Br. 17; cause national blackouts and brownouts, NEI Bt. 20, CCEEB Br. 12-14; have a "very negative impact on the reliability of the electrical supply system." UWAG Br. 11; require 20 new coal-fired power plants to compensate for the "energy penalty" of compliance, UWAG Br. 20-21, NEI Br. 16, increase air pollution dramatically, UWAG Br. 28; harm protected species including the Florida Manatee, UWAG Br. 55-56; decrease national security, API Br. 6, and undermine "fundamental principles of cooperative federalism," State's Br. on Behalf of Petitioners 3-7, all in furtherance of the lower court's zeal to impose a "one size fits all" stratagem, *id.* at 2, to save "every possible fish." Entergy Br. 36, 49.

Industry has long hurled similarly dire predictions of doom at technology based standards.[25] Yet such dire consequences have not occurred in thirty-six years of experience under the Clean Water Act. Implementing BPT, BCT, BAT, and BADT, EPA has issued hundreds of effluent limitations under the Clean Water Act that were based on the capacity of technology to reduce pollution discharges, without balancing compliance costs and environmental benefits.[26] These standards regulate discharges by every major industrial sector. Petitioners cannot point to any example, however, where the failure to conduct broad-ranging cost-benefit balancing in setting technology-based standards has led to absurd results. Indeed, while industry has brought dozens of suits to challenge effluent limitations set by EPA, in no case has a court ruled that the absence of cost-benefit balancing was irrational or led to absurd results.

On the contrary, implementation of the Clean Water Act's technology-based effluent limitations has dramatically reduced water pollution and improved water quality across the nation. When the Clean Water Act was enacted, only about one-third of surface waters met water quality goals. By 2000, two-thirds of waters met their goals.[27] The Clean Water

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[25] *See e.g.*, Percival et al., ENVIRONMENTAL REGULATION, LAW, SCIENCE, AND POLICY, 564-568 (tailpipe emission standards) (5th Ed., Aspen 2006).

[26] *See* http://www.epa.gov/waterscience/guide/industry.html (listing effluent guidelines by industrial category).

[27] *See* EPA, Water Quality Conditions in the United States: A Profile from the 2000 National Water Quality Inventory 1

Act's successes are directly related to the promulgation of technology-based standards. Within three years after the promulgation of BAT standards, industrial discharges of toxins into the nation's waters dropped from 412 to 197 million pounds per year.[28] To be sure, these technology-based effluent limitations have imposed considerable costs on industry, as Congress anticipated. EPA has estimated that the Clean Water Act has required regulated industries to increase their pollution control costs by $3 billion to $5 billion per year.[29] No evidence suggests, however, that these costs have been crippling for any sector. If anything, the opposite is true. Technology based standards have helped to support the national economy and made the nation more competitive. For example, EPA has concluded that the annual monetized benefits resulting from these water pollution efforts is $11 billion, far in excess of the costs.[30] Accordingly, even

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(2001), http://www.epa.gov/305b/2000report/factsheet.pdf; EPA, *National Water Quality Inventory: Report to Congress, 2002 Reporting Cycle: National Studies of Water Quality* (2007).

[28] EPA, National Water Quality Inventory: 1994 Report to Congress." (1995); Adler, Landman and Cameron, The Clean Water Act 20 Years Later, Island Press (1993).

[29] *See* EPA, *A Retrospective Assessment of the Costs of the Clean Water Act: 1972 to 1997* (2000) at 7-3, available at http://www.epa.gov/waterscience/economics/costs.pdf.

[30] *See* EPA, *A Benefits Assessment of Water Pollution Control Programs Since 1972: Part 1, The Benefits of Point Source Controls for Conventional Pollutants in Rivers and Streams* (2000) at viii, available at http://www.epa.gov/waterscience/economics/assessment.pdf.

without the use of broad cost-benefit balancing, the benefits from effluent limitations far exceeds the costs. At the same time, there is no credible evidence that the costs of Clean Water Act compliance have adversely affected either the American economy or the nation's competitiveness.[31]

As with the other technology based standards, EPA has ample authority under the terms of Section 316(b) to avoid the absurdities petitioners predict. For instance, petitioners and their amici repeatedly and erroneously argue that, in the absence of cost-benefit balancing, industry would be required to spend enormous amounts of money to save even one fish. *See, e.g.*, Entergy Br. 36. That is plainly untrue. Section 316(b) gives EPA discretion to conclude that the loss of one fish is de minimis and that its survival is not necessary for "minimizing adverse environmental impact."[32] By the same token,

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[31] *See* William L. Andreen, *Water Quality Today—Has the Clean Water Act Been a Success?*, 55 Ala. L. Rev. 537, 542 (2004) (reviewing studies).

[32] The de minimis doctrine spares agency resources for more important matters. Public Citizen v. FDA, 831 F.2d 1108, 1112 (D.C. Cir. 1987). Congress has much bigger fish to fry than respondents' "one fish." EPA estimates that but for intake structures, 3.4 billion more fish in the U.S. would survive for at least one year, roughly the age of fecundity and commercial viability for many species. *See* Pet. App. 122a, 168a-174a. Proper application of Section 316(b) will save billions of fish, every year, and hundreds of billions of fish over the lifetime of a typical powerplant. The far-fetched hypothetical that EPA would concern itself over saving one fish is belied by the massive environmental reality actually at issue.

petitioners are wrong to assert that, in the absence of cost-benefit analysis, industry will be required to employ costly control technology even when they are operating in water bodies that have little or no aquatic life. Technology-based standards do not require that industry adopt particular forms of technology but instead are performance standards based on the available technology. *See National Wildlife Federation v. EPA*, 286 F.3d 554, 558 (D.C. Cir. 2002). A facility that may meet the performance standard because of the nature of the water body in which it operates thus would not need to adopt any new controls.

If EPA were to adopt regulations implementing Section 316(b) that resulted in any of the absurdities petitioners predict, petitioners would of course be free to challenge the standard as arbitrary, capricious, and contrary to law under the Administrative Procedure Act. The remote and entirely theoretical possibility that EPA may someday adopt irrational regulations implementing Section 316(b), however, provides no basis to construe the provision contrary to its plain text, which requires EPA to set standards based on the best technology available for minimizing adverse environmental impacts, and provides no authority to set standard that purport to balance costs and benefits.[33]

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[33] Petitioner Entergy mistakenly relies on Weinberger v. Romero-Barcelo, 456 U.S. 305, 316 (1982) to support reading the Clean Water Act to provide EPA broad discretion. Petitioners Br. 37. *Weinberger* involved prosecutorial discretion, not statutory discretion..

II. SECTION 316(b) ESTABLISHES A TECHNOLOGY-BASED STANDARD THAT DOES NOT AUTHORIZE BALANCING ENVIRONMENTAL BENEFITS AND COMPLIANCE COSTS

As with the provisions laying out the Act's other technology-based standards, Section 316(b) directs EPA to determine performance standards based solely on technological capacity—in this case, the capacity of technology to minimize the adverse environmental impacts of intake structures. As with the Clean Water Act's other technology-based standards, Section 316(b) sets a standard that does not involve any determination of when it is economically reasonable to allow environmental harms.

Petitioners, however, argue that Section 316(b) should be read to authorize EPA to set standards for intake structures based on cost-benefit analysis simply because Section 316(b) does not expressly prohibit it. As Petitioner Entergy declares, "[i]n the absence of statutory language clearly signaling congressional disapproval, cost-benefit analysis is *always* reasonable." Entergy Br. 56. That argument, however, runs counter to basic principles of statutory construction and administrative law and is inconsistent with the text and structure of Section 316(b).

A. The Absence of Express Prohibition to Set Standards Based on Cost-Benefit Analysis Is Not Tantamount to Congressional Authorization

Petitioners repeatedly err in how they frame the textual issue before this Court. They mistakenly assert that EPA is entitled to deference because the text of Section 316(b) does not "foreclose" or "forbid" or "prohibit" cost-benefit analysis. See, e.g., Entergy Br. 55; UWAG Br. 26, 31, 32. Under petitioners' understanding of executive agencies' authority, EPA is free to set standards based on cost-benefit analysis (or any other methodology it might choose) unless the statute "unambiguously forbid[s]" it. UWAG Br. at 32. To be sure, when it is unclear whether a statute authorizes a particular regulatory approach, an agency is entitled to deference if its chosen approach is reasonable within the statutory context. *See Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837 (1984). But there is no principle of statutory construction or agency authority that remotely suggests that an agency has power to do whatever it wants unless Congress has unambiguously forbidden it.

By the same token, there is no support for the notion that cost-benefit analysis is prohibited unless Congress expressly authorized it, just as there is no support for petitioners' contrary suggestion that cost-benefit analysis is presumptively authorized unless Congress expressly prohibited it. As with other questions of agency authority, whether cost-benefit analysis is authorized depends on ordinary principles of statutory construction. In the context of the Clean Water Act, Congress gave careful consideration to the question of how EPA should consider compliance costs

in setting performance standards. Whether those standards should be based on cost-benefit analysis is a fundamental policy choice that Congress cannot be presumed to have concealed: "Congress, we have held, does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions—it does not, one might say, hide elephants in mouseholes." Whitman v. Am. Trucking Assns., Inc., 531 U.S. 457, 468 (2001).

EPA would be empowered to set standards under Section 316(b) based on cost-benefit analysis only if Congress authorized it. *Id.* ("[T]o prevail in their present challenge, respondents must show a textual commitment of authority to the EPA to consider costs in setting NAAQS."). The ordinary meaning and structure of Section 316(b), however, show Congress did not grant EPA the fundamental authority to conduct a cost benefit analysis.

B. The Plain Text of Section 316(b) Does Not Authorize Cost-Benefit Analysis

Petitioners and their amici strenuously and extensively argue that it would be "rational," Entergy 4, "reasonable," UWAG Br. 4, "flexible," ACC Br. 4, or "sound," AEI Br. 13, to authorize EPA to conduct cost-benefit analysis under Section 316(b), but those arguments are both wrong and beside the point. As EPA acknowledges, "the question presented here is not whether or to what extent cost-benefit analysis is a good thing." EPA Br. 14.[34] The issue instead is

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[34] Whitman v. Am. Trucking Assns., Inc., 531 U.S. 457, 465, (2001) (Scalia, J.) ("Were it not for the hundreds of pages of briefing [industry challengers] have submitted on this issue,

whether Congress *has authorized* EPA to use a cost-benefit analysis in applying Section 316(b). The text, objective, and structure of Section 316(b) demonstrate that it did not.[35]

1. The Text of Section 316(b) Focuses on Technological Capacity

Under Section 316(b), EPA properly identified entrainment and impingement of fish and shellfish as the primary "adverse environmental impacts" associated with cooling water impact structures. EPA Br. 2, 6; Pet. App. 3a, 226a. Having done so, EPA was required to determine which of the "available" technologies is "best" for "minimizing" those impacts. A technology is available if it is "present and ready for use," but not if it is so costly as to be unobtainable. *See* Environmental Respondents Br. 25. Once EPA identifies the pool of available technologies, it must determine which of those technologies is "best . . . for minimizing" impingement and entrainment. "Best" means "surpassing all others in excellence," and "minimize" means to reduce to the "smallest possible amount, extent, size or degree." *Id.*

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one would have thought it fairly clear that this text does not permit the EPA to consider costs in setting the standards.")

[35] Petitioners' reliance on Cass Sunstein's writings is inapposite. Entergy Br. 26 n.8. Professor Sunstein would apply his cost benefit "default principles" only "*[i]f* Congress has not referred to costs ... [or] resolved the question whether costs should be considered." Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 Mich. L. Rev. 1651, 1684-85 (2001) (emphasis added). But of course the Clean Water Act *does* refer to costs and resolves the questions concerning their role, even as in Section 316(b) when it has not required a cost benefit analysis.

25-26.[38] Thus, under the plain terms of Section 316(b), technology that allows the smallest possible amount of impingement and entrainment is the "best" for "minimizing" those impacts.

Section 316(b), like the Clean Water Act's other technology-based standards, focuses on technological capacity, not on how much environmental harm should be allowed. Petitioners, however, read into Section 316(b) nearly unlimited discretion to pick the technology that is "best," not at minimizing adverse impacts, but "best" based on a "balancing of complex goals." Entergy Br. 32-33. Petitioners thus argue that the "best technology available for minimizing adverse environmental impact" is not necessarily the technology that succeeds at reducing adverse environmental impacts the most but instead is "the most suitable or desirable technology available for reducing such impact, to whatever extent the decisionmaker believes appropriate in light of competing values." Entergy Br. 36. Petitioners simply ignore the statutory language in asserting that EPA can pick whatever technology it considers "best" unmoored from a determination of whether the

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[38] See James R. May and Maya van Rossum, *The Quick and the Dead: Fish Entrainment, Entrapment, and the Implementation and Application of Section 316(b) of the Clean Water Act*, 20 Vt. L. Rev. 373, 385-86 (1995). Petitioner's elaboration on the word "minimize" defies etymology. Petitioner Br. 34. Using a word improperly does not vitiate the word's actual meaning. Just because someone uses one word (here, "minimize") when the meaning of another word is intended ("reduce) (gas consumption, workplace mishaps) does not mean that "minimize" now means "reduce."

technology is best "for minimizing adverse environmental impact."

Likewise, petitioners' construction of how EPA should assess the "adverse environmental impacts" ignores the Clean Water Act's technology-based approach. Petitioners construe the phrase to give EPA authority to consider when protecting aquatic life will produce "actual environmental benefit." Entergy Br. 2.; *id.* at 46-49; UWAG Br. 6-11. Petitioners assert that EPA should consider that all fish are not created equal; some fish are "nuisance fish that federal and state regulators want to eliminate," while other fish are worthy of being saved. Entergy Br. 23. According to petitioners, a loss of fish may cause varying degrees of "adverse environmental impact" depending on how aquatically rich the water body is. Entergy Br. 48; UWAG Br. 9-10. Petitioners thus would transform Section 316(b) into a water quality-based approach, under which regulators would attempt to assess exactly how much environmental harm a loss of fish and other organisms would cause in the context of particular water bodies and then determine whether such harm is acceptable.

Petitioners' approach is precisely what Congress rejected when it chose to ground the protection of waters on technological capacity.[39] As the Fourth Circuit explained, setting technology-based standards based on local environmental conditions "would

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[39] *See, e.g.*, Appalachian Power Co. v. EPA, 671 F.2d 801, 809 n.3 (4th Cir. 1982); Hercules, Inc. v. EPA, 598 F.2d 91, 116 (D.C. Cir. 1978); Association of Pacific Fisheries v. EPA, 615 F.2d 794, 805 (9th Cir. 1980).

violate the plain intent of the [Clean Water Act] that effluent limitations and guidelines are to be based entirely upon technological standards and may not be varied or modified due to the nature or quality of the receiving waters."[40]

In Section 316(b), Congress did not assign EPA the task of assessing the *value* of fish and other aquatic life lost by entrainment and entrapment, nor is EPA authorized to make the policy determination of how many fish it is economically reasonable to protect. Congress simply directed EPA to examine the capacity of available technology to minimize impingement and entrainment (or any other impacts EPA properly identifies) and to set a performance standard based on the technology that best minimizes those effects. As with the determination of technology's capacity to reduce water pollution, Section 316(b) focuses on technological capacity to minimize entrainment and impingement and does not call on EPA to determine how much impingement and entrainment should be curtailed.[42]

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[40] Appalachian Power, 671 F.2d at 806.

[42] It is simply wrong to say that interpreting Section 316(b) to authorize a cost-benefit analysis "reflects 30 years of agency practice" Entergy Br. 23, or a "longstanding policy." EPA Br. *in passim*. If anything, EPA's position for four decades was just the opposite, that "there is *nothing* in Section 316(b) indicating that a cost/benefit analysis *should be done*." In re Public Service Co. of N.H. et al. (Seabrook Station Units 1 and 2) National Pollutant Discharge Elimination System Permit, 10 Env't Rep. Cas. (BNA) 1257, 1261 (EPA June 17, 1977) (emphasis added); *see* J.A. 60. To the extent it has considered cost effectiveness under Section 316(b), it has not compared marginal costs with marginal environmental

2. The Text of Section 316(b) Does Not Mandate a Particular Technology

Contrary to petitioners' suggestion, Section 316(b) does not mandate a particular technology—closed cycle cooling towers—to minimize the adverse environmental impacts of every existing intake structure. Entergy Br. 13-14. The lower court did not construe Section 316(b) as demanding either closed cycle cooling for every Phase II facility, or that industry pay "hundreds of millions or billions per facility regardless of the cost or actual environmental benefit," Entergy Br. 2. The lower court did not read the statute as mandating "the survival of every possible fish." Entergy Br. 36. Instead, as the lower court held and Petitioners concede, Entergy Br. 14, EPA has within its discretion expressed "best technology available for minimizing adverse environmental impact" as a range of performance parameters, including an 80 to 95 percent reduction in impingement and a 60 to 90 percent reduction in entrainment for listed waters, such as the Great Lakes, estuaries and tidal marshes, compared to a baseline "zero technology alternative," 69 Fed. Reg. at 41,590-41,601; Pet. App. 260a.

Thus, Section 316(b) authorizes EPA to enable industry to comply by choosing among a "suite" of innovative technologies, including (1) advanced

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benefits. Rather, EPA has considered the monthly "marginal rate increase" to customers of instituting a particular technology, such as closed-cycle cooling towers. May and van Rossum, 471-479. In reality, EPA has not seen fit to conduct a cost-benefit analysis in applying Section 316(b) to an existing facility.

removal and return systems, namely, traveling, disk, drum, and fixed screens; (2) active exclusion technologies, namely, wedgewire screens, perforated pipes, radial wells, porous dikes, and artificial filter beds; and (3) physical and behavioral diversion and/or avoidance technologies, such as louvers, velocity caps, and (4) physical and hydraulic barriers such as sound barriers or bubble curtains. *Id; see* May and Van Rossum, at 456-459 (discussing availability of each means of best technology available under Section 316(b)); State Br. as Respondent, 9-12 (discussing state implementation of each means). These other available technologies also happen to be a fraction of the cost of closed-cycle cooling.

Section 316(b) does not, however, authorize EPA to weigh costs against quantified environmental benefits in establishing its performance standard. But for EPA's mistaken reliance on a cost-benefit analysis that Section 316(b) does not authorize, the performance parameters might have been more stringent, say, calling for a 90 to 98 percent reduction in impingement – instead of 80-95 percent – and a 80 to 95 percent reduction in entrainment – instead of 60-90 percent. While EPA has discretion to express technology based standards under Section 316(b) in terms of a range of performance efficiency, it does not have the discretion to conduct a cost-benefit analysis in establishing the standard.

3. The Statutory Context of Section 316(b) Does Not Support Cost-Benefit Balancing on a Site-Specific Basis

There is also no support for the proposition that a permit writer (either EPA or the state) has "general

authority" to conduct an *additional* cost-benefit analysis in *implementing* an "alternative" to best technology available on a site-specific basis. Entergy Br. 9, 15, 20. Essentially petitioners argue that the section *sub silentio* provides for variances from national performance standards.

Yet unlike other sections in the Act, Section 316(b) does not provide for local variances of any kind, not to mention based on a cost-benefit analysis. When the Clean Water Act provides for local site-specific variances it does so only under limited circumstances, and never based on a local cost-benefit analysis. And as mentioned above, it is assumed intentional when Congress authorizes in one place in the statute what it withholds in another.

In reality, the Clean Water Act severely restricts the extent to which EPA and states may grant variances from technology-based standards in consideration of site-specific conditions. See e.g., 33 U.S.C. §1311(m) (variances from BPT and BCT under limited specified conditions for certain discharges of into "deep waters of the territorial seas."); 33 U.S.C. §1311(g)(1), (2)(A) – (C) (modifications from BPT for certain pollutants); 33 U.S.C. §1311(n) (from BAT due to "fundamentally different factors.") Section 316(b), on the other hand, does not authorize site-specific variances, including those based on a local cost-benefit analysis.

The plain text of Section 316(b) stands in sharp contrast to its immediate neighbor, Section 316(a), which allows for local variance for the discharge of

heated water. 33 U.S.C. § 1326(c).[43] Close comparison of Sections 316(a) and 316(b) supports the notion that Section 316(b) sets national standards, as opposed to allowing local variances based on costs or other factors, not to mention a plenary cost benefit analysis. Section 316(a) allows the *permit writer* (either EPA or an authorized state agency) to issue a variance whenever a permittee demonstrates that a limit on discharge of heated water is more stringent than necessary to assure "a balanced *indigenous* population of shellfish, fish and wildlife *in and on the body of water into which the discharge is to be made.*" 33 U.S.C. § 1316(a) (emphasis added). Section 316(b), on the other hand, requires *EPA* to set BTA to minimize adverse environmental impact whenever it sets national performance based standards under Sections 301 or 306. It does not allow agencies to grant variances from BTA due to consideration of local populations of shellfish, fish, or wildlife, or for any other reason.

These subsections operate differently for good reason: Section 316 is the result of compromise respecting point sources that have intake structures. Environmental Respondents Br. 7-9. The Senate version of the section would have been solely technology-based. The House version would have been solely based on local water conditions. The compromise was to have Sections 316(a) & (c) require

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[43] Section 316(a) governs discharges of "heat," which the Clean Water Act defines as a "pollutant," 33 U.S.C. § 1362(6), and therefore subject to the technology-based standards for point source discharges of pollutants, 33 U.S.C. §§ 1311 (existing sources) & 1316 (new sources).

technology-based standards for discharges of heated water subject to a 10-year variance based on local water conditions, but to have Section 316(b) retain a national technology-based approach for minimizing adverse environmental impact. *Ibid.* This is a sensible compromise that the language of the CWA clearly reflects.

CONCLUSION

For the reasons given above, as well as those expressed in the briefs of respondents and their amici, this Court should affirm the judgment of the Second Circuit.

JAMES R. MAY
Widener University School of Law
4601 Concord Pike
Wilmington, DE 19803
(302) 477-2060

JARED A. GOLDSTEIN*
Roger Williams University School of Law
Bristol, RI 02809
(401) 254-4594

* Counsel of Record

AMICUS CURIAE BRIEF

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In the Supreme Court of the United States

ENTERGY CORPORATION, *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL., *Respondents.*

PSEG FOSSIL LLC, ET AL., *Petitioners,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

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BRIEF FOR THE STATES OF ILLINOIS, IOWA, MARYLAND, MONTANA, OHIO, AND OKLAHOMA, THE COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND THE COMMONWEALTH OF PUERTO RICO AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

MICHAEL A. SCODRO*
Solicitor General

JANE ELINOR NOTZ
Deputy Solicitor General

LISA MADIGAN
Attorney General of Illinois
100 West Randolph Street
Chicago, Illinois 60601
(312) 814-3698

* Counsel of Record
[additional counsel listed on signature page]

Becker Gallagher · Cincinnati, OH · Washington, D.C. · 800.890.5001

QUESTION PRESENTED

Whether § 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

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INTEREST OF THE *AMICI CURIAE*

The *amici* have two critical interests in the outcome of this case. First, the *amici* are devoted to preserving the aquatic ecosystems on which they depend. Absent stringent regulation, cooling water intake structures have devastating effects on fish and other aquatic organisms, which are not only important environmentally, but also serve critical commercial, economic, and recreational purposes. Both because of the importance of aquatic ecosystems and because many have already been substantially compromised, the *amici* have a vital interest in protecting these ecosystems from additional, undue predation by human activity.

Second, because the States share responsibility for enforcing the Clean Water Act ("Act") with the federal Environmental Protection Agency ("EPA"), the *amici* have a powerful interest in a regulatory system that is workable in practice and provides for accurate and consistent results. Yet under the EPA regulations challenged here, permitting authorities are required to undertake complicated and costly assessments that Congress has not authorized and that EPA itself failed to complete. The *amici* are concerned that requiring state agencies to conduct such assessments would strain state resources, encourage needless disputes between state permitting authorities and applicants, slow the permitting process—delaying the issuance of timely permits—and likely lead to inconsistent or inaccurate permitting decisions.

STATEMENT

1. Many power plants and other industrial facilities cool their equipment with water drawn from oceans, rivers, lakes, and streams using one of two basic "cooling water intake structures." Pet. App. 6a, 12a n.3.[1] A "once-through" cooling system takes in water, sends it through the facility once to absorb heat, and returns it directly to the water body at a much higher temperature. *Id.* at 12 n.3. By contrast, a "closed-cycle" system draws in an initial quantity of water and then continually recirculates it between heat-bearing machinery and an external cooling device, such as a cooling tower or pond. *Ibid.* Because new water is added to closed-cycle systems solely to compensate for evaporation, they use 96 to 98 percent less fresh water (and 70 to 96 percent less salt water) than comparable once-through systems. 69 Fed. Reg. 41,576, 41,601 n.44 (2004).

2. The environmental impact of withdrawing large amounts of cooling water is "staggering." *Riverkeeper, Inc. v. United States Environmental Protection Agency*, 358 F.3d 174, 181 (2d Cir. 2004) (hereafter "*Riverkeeper I*"). In the rule at issue here, EPA determined that cooling water intake structures may cause "multiple * * * undesirable and unacceptable environmental impacts," including:

> entrainment and impingement; reductions of threatened and endangered species; damage to critical aquatic organisms, including

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[1] Citations are to the appendix to the petition for certiorari in *Utility Water Act Group v. Riverkeeper, Inc.*, No. 07-597 (U.S.).

> important elements of the food chain; diminishment of a population's compensatory reserve; losses to populations including reductions of indigenous species populations, commercial fisheries stocks, and recreational fisheries; and stresses to overall communities and ecosystems as evidenced by reductions in diversity or other changes in system structure and function.

69 Fed. Reg. at 41,586.[2]

Notwithstanding these devastating effects, the nation's power plants and factories continue to withdraw more than 279 billion gallons of cooling water each day. See *Riverkeeper I*, 358 F.3d at 181. EPA estimates that the use of cooling water by the thermoelectric power industry accounts for fully 47 percent of all withdrawals from U.S. waters. 69 Fed. Reg. at 41,586. Because of the vast quantities of cooling water used, and the associated destruction of fish and other organisms, the power industry "[c]ollectively * * * constitutes the country's single largest consumer of aquatic life." James R. May & Maya K. van Rossum, *The Quick and the Dead: Fish Entrainment, Entrapment, and the Implementation and Application of Section 316(b) of the Clean Water Act*, 20 Vt. L. Rev. 373, 381 (1995). Indeed, EPA has determined that the nation's larger power plants alone destroy the equivalent of more than 3.4 billion fish and

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[2] "Impingement" occurs when larger organisms, like fish and shellfish, are crushed against the screens at the mouth of the intake pipe, while "entrainment" refers to smaller organisms, like plankton, eggs, and larvae, being sucked into the pipe and killed by the system's pressure and heat. 69 Fed. Reg. at 41,586.

shellfish each year. 69 Fed. Reg. at 41,586. This means that a single power plant may impinge more than one million adult fish in a three-week period. See *Riverkeeper I*, 358 F.3d at 181.

3. In 1972, Congress amended the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," 33 U.S.C. § 1251(a), "the national goal" being to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife," 33 U.S.C. § 1251(a)(2). Because of the devastating ecological impacts of impingement and entrainment, Congress called on the EPA to remedy the problem by "requir[ing] that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available [("BTA")] for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). Congress recognized that even as the Act's pollution control efforts improve overall water quality, the effects of impingement and entrainment could inhibit the recovery and preservation of aquatic ecosystems.

In 1976, EPA issued its first regulations pursuant to § 316(b), which the Fourth Circuit remanded to EPA without addressing their merits. 69 Fed. Reg. at 41,583-41,584 (discussing *Appalachian Power Co. v. Train*, 566 F.2d 452 (4th Cir. 1977)). After years passed without new regulations, environmental groups sued EPA and won a consent decree requiring the agency to establish a timetable to issue rules under § 316(b) in three phases. 69 Fed. Reg. at 41,583. Phase I regulates intake structures at new sources, Phase II covers large, existing power plants, and Phase

III regulates other power plants and industrial facilities. *Ibid.*

The Phase I Rule requires use of a closed-cycle cooling system or alternative technology capable of a comparable reduction in impingement and entrainment. 69 Fed. Reg. at 41,601. Because closed-cycle systems withdraw substantially less water than once-through systems, they destroy far less aquatic life. 69 Fed. Reg. at 41,601 & n.44. EPA estimates that a closed-cycle system may reduce impingement mortality and entrainment by as much as 98 percent, when compared with a once-through system. *Ibid.* On judicial review, the Second Circuit largely upheld the Phase I Rule. See *Riverkeeper I*, 358 F.3d at 181.

4. On July 9, 2004, EPA issued its Phase II Rule. Because large, existing power plants withdraw approximately 214 billion gallons of cooling water each day, 69 Fed. Reg. at 41,586, this rule regulates the vast majority of withdrawals. EPA declined to select closed-cycle cooling as BTA for large, existing power plants—as it had for new plants under the Phase I Rule—and instead adopted national performance standards based on reductions in impingement mortality and entrainment associated with a "range" of technologies (including fine- and wide-mesh screens, aquatic filter barrier systems, barrier nets, and fish return systems) that EPA "determined to be commercially available for the industries affected as a whole." 69 Fed. Reg. at 41,598-41,599, 41,601. The performance standards require as little as 60 percent reduction in entrainment and 80 percent reduction in impingement mortality. 40 C.F.R. § 125.94(b)(1), (2). Thus, the Phase II standards require far less than the

98 percent reductions achievable with closed-cycle cooling.

The Phase II Rule also allows for two site-specific exceptions from the general requirements—a "cost-cost variance" and a "cost-benefit variance." 40 C.F.R. § 125.94(a)(5)(i), (ii). The former is available if a plant demonstrates that its costs of complying "would be significantly greater than the costs considered by the Administrator * * * in establishing the applicable performance standards," while the latter applies where a plant shows that its compliance costs "would be significantly greater than the benefits of complying with the applicable performance standards." *Ibid.* Variance requests are evaluated by the applicable permitting authority, including a state permitting authority operating under the National Pollution Discharge Elimination System ("NPDES"). 69 Fed. Reg. at 41,593.[3] If a facility makes either required showing, the permitting authority "must make a site-specific determination" of BTA and impose "site-specific alternative requirements" that are "as close as practicable to the applicable performance standards." 40 C.F.R. § 125.94(a)(5)(i), (ii). Or the permitting authority may conclude that additional measures are unnecessary, either because of their "significantly greater costs" under the cost-cost variance or because

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[3] NPDES is the permitting process though which the requirements of the Act and its regulations are enforced. 33 U.S.C. § 1342(b). Every facility operating a cooling water intake structure must obtain a permit from either EPA or an EPA-approved state agency. *Ibid.*; see also 40 C.F.R. § 123.1(d). Forty-five States and the Virgin Islands are authorized to administer the NPDES permitting program. 69 Fed. Reg. at 41,582.

the "costs would be significantly greater than the benefits" under the cost-benefit variance. *Ibid.*

5. On petition for review, the Second Circuit remanded for additional explanation of EPA's choice of BTA and, if necessary, for a new determination of BTA. Pet. App. 41a-42a. The court noted that "the record is unclear as to the basis for the EPA's selection of the suite of technologies as BTA," and suggested that EPA rejected closed-cycle cooling as BTA only by using cost-benefit analysis in violation of § 316(b). Pet. App. 34a-41a. Because the Rule's cost-benefit variance authorized site-specific determinations of BTA based on cost-benefit analysis, the court rejected it as well. Pet. App. 63a.

The court did not reject outright the cost-cost variance. Instead, the court noted that although § 316(b) does not expressly authorize EPA to allow permitting authorities to grant variances from generally applicable requirements, it did not doubt that EPA could allow variances so long as the agency "'guide[d] the permitting authority to consider appropriate factors and allow[ed] relaxation of the Rule's uniform technology requirements only insofar as necessary to account for unusual circumstances not considered by the Agency during its rulemaking.'" Pet. App. 55a-56a n.22 (brackets in original) (quoting *Riverkeeper I*, 358 F.3d at 193-194). However, because of procedural problems in the promulgation of the cost-cost variance and because the variance is expressly premised on the validity of the BTA determination, which itself was remanded for further explanation, the court found it necessary to remand the cost-cost

variance, too, for additional proceedings. Pet. App. 56a-57a.

On April 14, 2008, this Court granted certiorari on the question "[w]hether Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency (EPA) to compare costs with benefits in determining the 'best technology available for minimizing adverse environmental impact' at cooling water intake structures."

SUMMARY OF ARGUMENT

This Court should affirm the judgment below for all of the reasons set forth in state-respondents' brief. Petitioners' contrary position is impossible to square with the plain language of § 316(b), the provision's context within the Clean Water Act, and the legislative history of the 1972 Clean Water Act amendments. This brief provides two additional reasons—both of particular significance to the States, who share responsibility for enforcing the Clean Water Act—for affirming the decision below.

First, petitioners and their *amici* incorrectly argue that, without the authority to undertake a cost-benefit analysis, neither EPA nor state permitting authorities will be able to account for local circumstances by providing for site-specific compliance alternatives. As the Second Circuit correctly concluded, a properly crafted variance provision would address site-specific considerations, without weighing costs and benefits in making these individualized determinations. Neither petitioners nor their *amici* successfully identify any circumstance under which site-specific relief from generally applicable standards would be appropriate under the Clean Water Act but somehow unavailable without a cost-benefit variance provision.

Second, requiring state permitting authorities to perform cost-benefit analysis on a case-by-case basis would strain state resources, fuel needless disputes between permit writers and applicants, and prolong the permitting process. Given the complex nature of biological systems and the concomitant complexities associated with quantifying and monetizing environmental benefits, any such analysis is a time-

consuming and resource-intensive process. Moreover, because EPA failed to complete its own benefits analysis for the Phase II Rule, and therefore undervalued environmental benefits, there is a real risk that States also will be unable to fully value the benefits associated with reductions in impingement and entrainment, yielding inconsistent or inaccurate permitting decisions. For these practical reasons, States should not be expected to perform cost-benefit analysis when EPA itself did not deliver it and when not required by Congress.

ARGUMENT

Petitioners and their *amici* fail in their effort to overcome language and history with a policy argument—that only a cost-benefit analysis can account for local factors specific to individual sites. In fact, the variance process already accounts for these factors, without departing from the Act's plain language and legislative history. And even if the promotion of good policy were a sound basis for ignoring text and history, that policy surely favors the respondents here, for the rule that petitioners espouse would require States needlessly to undertake burdensome cost-benefit analyses.

I. SITE-SPECIFIC CONSIDERATIONS ARE PROPERLY ADDRESSED THROUGH THE VARIANCE PROCESS, WITHOUT RESORT TO COST-BENEFIT ANALYSIS.

Petitioners and their state *amici* argue that the court below unadvisedly adopted a "'one-size-fits-all'" approach to the regulation of cooling water intake structures, Entergy/PSEG Br. 31, Nebraska Br. 10, and that, without the authority to undertake cost-benefit analysis when determining BTA, permitting

authorities will be unable to "tak[e] account of local waterbody characteristics" when writing permits and "provide site-specific compliance options," Nebraska Br. 8; see also Entergy/PSEG Br. 48. This concern is misplaced. The Second Circuit correctly concluded that site-specific considerations may be addressed through the variance process, and that cost-benefit analysis is unnecessary in making these individualized determinations. Pet. App. 55a-56a & n.22. Tellingly, neither petitioners nor their *amici* identify a single, hypothetical circumstance in which a deviation from generally applicable standards would be appropriate yet unavailable without cost-benefit analysis.

Although the Second Circuit remanded the cost-cost variance provision for further proceedings, the court did not doubt EPA's authority to make site-specific compliance alternatives available. Pet. App. 55a-57a & n.22. The court thus followed its prior holding in *Riverkeeper I* that while § 316(b) does not specifically authorize EPA to allow site-specific variances from general standards, this silence does not prohibit EPA from allowing such variances, so long as the variance provision does not leave "alternative requirements to the Agency's 'unfettered discretion'" and "'guide[s] the permitting agency to consider appropriate factors * * *.'" Pet. App. 55a-56a n.22 (quoting *Riverkeeper I*, 358 F.3d at 193-194). Although the issue of whether EPA is either authorized or required to provide for variances from § 316(b) for site-specific conditions is not before this Court, neither respondents nor their *amici* question the EPA's ability to provide site-specific compliance options—provided their availability is limited by consideration of appropriate factors—in light of this Court's decision in

E.I. du Pont de Nemours & Co. v. Train, 430 U.S. 112 (1977).

In *du Pont*, the Court held that § 301 of the Act allows the EPA to set uniform, industry-wide effluent limitations for existing plants, "so long as some allowance is made for variations in individual plants." 430 U.S. at 128. In particular, the Court found that although § 301 only expressly contemplates variances from standards set pursuant to § 301(b)(2)(A), (describing effluent limitations to become effective by July 1, 1983), EPA also must authorize variances from standards set pursuant to § 301(b)(1)(A) (describing the effluent limitations to become effective by July 1, 1977). See 430 U.S. at 128; see also *E.P.A. v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 72 (1980) (noting *du Pont*'s holding that although no "explicit variance provision exists with respect to [1977] standards," such a provision was nevertheless "a necessary aspect of [1977] limitations applicable by regulations to classes and categories of point sources").[4] The Court suggested

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[4] Section 301(c) provides that

> [t]he Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will respect the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

33 U.S.C. § 1311(c).

that a variance provision was necessary to give state permitting authorities an important role in administering the Clean Water Act. See *du Pont*, 430 U.S. at 133 n.24; see also *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1034 (D.C. Cir. 1978) (explaining that, in *du Pont*, "[t]he Court subscribed to the view that, by leaving the granting of variances to the state agencies in the first instance, the significance of their role would be preserved").

Following *du Pont*, therefore, the Second Circuit correctly recognized EPA's authority to allow variances from generally applicable requirements. Accordingly, petitioners and their *amici* are wrong to contend that state permitting authorities will be unable to make site-specific determinations under the Second Circuit's decision.

Nor do petitioners or their *amici* offer even a hypothetical scenario in which a variance from generally applicable standards would be appropriate but unavailable under the decision below. As an initial matter, the suggestion that without cost-benefit analysis, permitting authorities will be forced to "require technology to protect aquatic organisms that are not present" because the affected water bodies contain "essentially minimal aquatic life," Nebraska Br. 9; see also Entergy/PSEG Br. 50 ("[t]he Second Circuit's interpretation would compel EPA to order retrofits that are enormously expensive symbolic gestures"), may quickly be put to the side. The Second Circuit did not hold, and respondents do not contend, that facilities must install outrageously expensive technology under circumstances where it would provide only trivial gains in effectiveness. To the contrary, the court below emphasized that certain facilities "fac[ing]

high compliance costs to achieve the national performance standards * * * may qualify for the cost-cost variance if such variance is retained on remand." Pet. App. 65a.[5] Thus, if a power plant were situated on a water body naturally devoid of aquatic life, the plant's operator would not have to retrofit it with expensive technology that would achieve at best *de minimis* reductions in impingement and entrainment just for the sake of complying with the national rule. Similarly, if the physical constraints of a plant's location made it technologically impossible to meet the national requirements, that facility also could obtain an exception from the generally applicable standards.

Petitioners and their *amici* also maintain that cost-benefit analysis is a necessary tool because under certain circumstances once-through cooling may provide a better means of protecting native aquatic populations than closed-cycle cooling. See UWAG Br. 52 & n.24; Nebraska Br. 9. But petitioners and their *amici* together identify only two examples of this purported phenomenon, neither one of which is persuasive.

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[5] The Second Circuit's approach comports with longstanding case law authorizing agencies to make *de minimis* exceptions to regulatory requirements even when the statutory language does not authorize such exceptions. See *Alabama Power Co. v. Costle*, 636 F.2d 323, 360 (D.C. Cir. 1979) (recognizing an "agency power, inherent in most statutory schemes, to overlook circumstances that in context may fairly be considered *de minimis*"); *Monsanto Co. v. Kennedy*, 613 F.2d 947, 954 (D.C. Cir. 1979) (finding "latitude inherent in the statutory scheme to avoid literal application of the statutory [language] * * * in those *de minimis* situations that * * * clearly present no public health or safety concerns").

First, *amici* argue that once-through cooling offers the "best means of maintaining the native aquatic organisms" in water bodies where "the major fish species that would incur impingement and entrainment mortality is invasive." Nebraska Br. 9; see also UWAG Br. 52-53 n.24. But as petitioners concede, EPA itself has disapproved this view, see *ibid.*; see also *id.* at 19 (noting that EPA "chose not to draw distinctions * * * based on the type of species affected"), rejecting in both the Phase I *and* Phase II rulemaking the power industry's argument that not all impingement and entrainment effects qualify as "adverse" environmental impacts because some "nuisance" species "require eradication." Pet. App. 86a (citing *Riverkeeper I*, 358 F.3d at 196). The Second Circuit, in turn, has twice approved EPA's approach on this score as "eminently reasonable." *Riverkeeper I*, 358 F.3d at 196; see also Pet. App. 86a-87a. In any event, because the warmer water discharged by once-through cooling may provide welcome habitat for invasive species while negatively impacting native organisms, there is no assurance that the use of this method will have the favorable outcome petitioners and their *amici* hypothesize. Moreover, neither the Clean Water Act nor § 316(b) contemplates that cooling water intake structures, notwithstanding their negative environmental effects, should be used to address environmental problems from other sources. States are far better off addressing invasive aquatic organisms at their source than by counting on environmentally destructive cooling methods to do so incidentally.

Second, petitioners and their *amici* point to Florida's West Indian Manatee population, which now

makes its habitat in the heated water discharged by once-through systems. See UWAG Br. 55-56 & n.27; Nebraska Br. 9-10. This concern relates to the effects of thermal discharges rather than impingement and entrainment, however, and thus is properly addressed by the Act's provisions regulating the thermal component of cooling water intake structures, not by § 316(b). Notably, § 316(a) of the Act provides for a variance from the general requirements for thermal discharges if the permit applicant can show that the applicable limitation is "more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made." 33 U.S.C. § 1326(a). Accordingly, so long as a permit applicant can establish that the effluent limits for heat are unnecessary to maintain a balanced indigenous population, the permitting authority may allow a variance from the effluent discharge limits.

Finally, petitioners' *amici* maintain that, unless authorized to apply cost-benefit analysis, States suffering from water shortages will be unable to "ensure that the minimal water necessary is consumed." Nebraska Br. 10. But closed-cycle cooling systems withdraw far less water—as much as 98 percent less—than once-through systems. Accordingly, any concern that the use of closed-cycle cooling might interfere with States' efforts at water conservation rings hollow. Not only will closed-cycle cooling engender the substantial environmental benefits associated with a reduction in impingement and entrainment, but there is no reason to believe that such systems will interfere with States' water management.

II. USE OF COST-BENEFIT ANALYSIS POSES SIGNIFICANT PRACTICAL PROBLEMS FOR STATE PERMITTING AUTHORITIES.

As *amici* explain, although cost-benefit analysis may in some circumstances be a useful tool for identifying when the benefits of regulation exceed its costs and thereby assist in the process of allocating resources efficiently, use of cost-benefit analysis results in a misallocation of resources if benefits are not correctly valued. See Economists Ackerman, et al. Br. 8-15. Critically, the complicated nature of biological systems raises substantial challenges to efforts to assign an accurate monetary value to environmental benefits. See *id.* at 8, 12. Quantifying and monetizing environmental benefits is a complex, time-consuming, and costly process, and, if the analysis is not completed properly, there is a risk that the effects of maintaining a healthy, biologically diverse environment will be undervalued. See, *e.g.*, Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. Pa. L. Rev. 1553, 1563-1581 (2002); Thomas O. McGarity, *A Cost-Benefit State*, 50 Admin. L. Rev. 7, 50-72 (1998).

The difficulties in accurately assessing the value of environmental benefits would raise significant practical problems for States under petitioners' cost-benefit approach. The Phase II Rule requires state permitting authorities to verify that a permit applicant meets the requirements of the approved compliance alternative the applicant selects. 69 Fed. Reg. at 41,643. Under petitioners' view that EPA may weigh costs and benefits when setting national performance standards for cooling water intake structures—and make available a "cost-benefit" compliance

option—state agencies would have to perform cost-benefit analyses in reviewing permit requests for such structures.[6] But undertaking a cost-benefit analysis is a labor-intensive and lengthy process that is likely to strain already limited state resources, encourage contention between applicants and permitting authorities, and slow permitting decisions, thereby delaying the timely issuance of necessary permits. In addition, given EPA's admitted failure to complete its analysis of environmental benefits in the Phase II Rule, there is a real risk that States also will be unable to account for potentially significant benefits associated with the installation of a particular technology.

As petitioners acknowledge, see UWAG Br. 23-24, to qualify for a cost-benefit variance, a permit applicant must submit—and the permitting authority must evaluate for accuracy—documents including a "Benefits Valuation Study," 40 C.F.R. § 125.95(b)(6)(ii). The study must attempt to "fully value the impacts of impingement mortality and entrainment" at the applicant's facility "and the benefits achievable by meeting the applicable performance standards." *Ibid.* Accordingly, the applicant must assign a monetized value to all of the benefits (commercial, recreational, and ecological) of compliance with national standards. 40 C.F.R. § 125.95(b)(6)(ii)(A). The applicant also must quantify and monetize certain "non-use" benefits,

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[6] Petitioners' *amici* suggest that under petitioners' approach, States would be permitted but not required to undertake a weighing of costs and benefits. See Nebraska Br. 13. To the contrary, if the cost-benefit variance is upheld, State permitting authorities will be required to perform cost-benefit analyses when reviewing permit requests that rely on the variance.

ibid.—that is, benefits that arise from reduced impacts to ecological resources that the public considers important, such as threatened or endangered species, 69 Fed. Reg. at 41,647. Attaching a reliable value to non-use benefits can be difficult, however, and, according to EPA, for at least some of these benefits "monetization is not feasible." 69 Fed. Reg. at 41,648 n.50. The Benefits Valuation Study must also include "a narrative description of any non-monetized benefits" arising from compliance with national standards "and a qualitative assessment of their magnitude and significance." 40 C.F.R. § 125.95(b)(6)(ii)(E). Finally, if the permit applicant utilizes an entrainment survival rate other than zero, the applicant must support its chosen rate with "[a]n analysis of the effects of significant sources of uncertainty on the results of the study." 40 C.F.R. § 125.95(b)(6)(ii)(C).

Every request for a cost-benefit variance thus requires the permitting authority to perform a complex review in an effort to verify the accuracy of the permit applicant's efforts to quantify and monetize the benefits of using a given technology at a particular facility. Indeed, in the rulemaking at issue here, EPA failed to complete its own analysis of the environmental benefits and conceded the difficulty of this undertaking, explaining that:

> [e]stimating economic benefits is challenging because of the many steps necessary to link reductions in impingement and entrainment to changes in impacted fisheries and other aspects of relevant aquatic ecosystems, and then to link those ecosystem changes to the resulting changes in quantities and values for the associated environmental goods and

> services that are ultimately linked to human welfare.

69 Fed. Reg. at 41,655. Thus, EPA's own findings confirm that the availability of a cost-benefit variance will make any agency's review of a permit application seeking such a variance an onerous process that will require substantial expertise and consume significant resources. Moreover, under petitioners' view, state permitting authorities will often be called upon to make these difficult determinations. In petitioners' own words, impingement and entrainment effects "vary dramatically from facility to facility," and, as a result, a significant number of BTA determinations must be made on a case-by-case basis. Entergy Corp./PSEG Br. 47; accord UWAG Br. 51-57.

EPA's findings also demonstrate that use of cost-benefit analysis is likely to slow down the permitting process. For example, under the cost-benefit compliance option, the permitting authority determines BTA only after it attempts to predict the benefits that reductions in impingement and entrainment will have on the fishing industry. As EPA acknowledged, however, although there is no doubt that "reducing the number of fish killed will increase the number of fish available for harvest," "[m]easuring the benefits of this effect is less straightforward." 69 Fed. Reg. at 41,659. This is because, as EPA explained in the Phase I Rule, "it is very difficult to assess the cause and effect of cooling water intake structures on ecosystems or an important species within an ecosystem." 66 Fed. Reg. 65,256-01, 65,285 (2001). Such assessments require complex biological studies, which "can take multiple years" and, in addition, because the studies are performed outside controlled

laboratory conditions, they implicate "a multitude of confounding factors," making them "very difficult to perform and * * * causation, in particular, very difficult to determine." *Ibid.* Thus, EPA concluded, "the time and complexity of conducting population studies properly is generally inconsistent with making fast and reliable permitting decisions." *Ibid.*

Finally, EPA, by its own admission, failed to complete the benefits analysis, which raises a real possibility that States will be unable to accurately conduct their own cost-benefit analyses. In the rulemaking below, EPA conceded that it had not assessed the value of all benefits associated with the expected results of the Phase II Rule, resulting in the undervaluation of environmental benefits. 69 Fed. Reg. at 41,657-41,661. For example, EPA acknowledged that "[b]ecause of the uncertainties and assumptions" underlying its analysis, its "estimates of benefits * * * may understate the benefits to recreational anglers." 69 Fed. Reg. at 41,659. The agency also recognized that although reducing impingement and entrainment losses "may result in both use and non-use benefits" and that "there is a real possibility that ignoring non-use values could result in serious misallocation of resources," it was "unable to value the non-use benefits associated with" the Phase II Rule. 69 Fed. Reg. at 41,660-41,661 (internal quotation marks and citation omitted); see also 69 Fed. Reg. at 41,666 ("EPA was not able to estimate the monetary value of non-use benefits resulting from the rule, although the Agency believes non-use benefits may be significant.").

There is no reason to believe that state permitting authorities—who generally have fewer resources in

terms of funding and expertise than EPA—will be able to perform an analysis that EPA failed to deliver. Instead, the difficulties in quantifying and monetizing environmental benefits will only fuel needless disputes between permit writers and applicants, further drawing out the permitting process and draining state resources. Moreover, because regulated companies will likely devote more resources to assessing the costs of installing a particular technology than its benefits, the complexity of the benefits inquiry may lead to inconsistent permitting decisions or, worse, decisions that purport to weigh costs against benefits but fail to account for the full environmental benefits associated with a particular technology and therefore authorize less effective methods at the expense of aquatic ecosystems. Given the Clean Water Act's commitment to preserving and maintaining the nation's water bodies, either result is intolerable.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

LISA MADIGAN
Attorney General of Illinois
MICHAEL A. SCODRO*
Solicitor General
JANE ELINOR NOTZ
Deputy Solicitor General
100 West Randolph Street
Chicago, Illinois 60601
(312) 814-3698
mscodro@atg.state.il.us

* Counsel of Record

OCTOBER 2008

TOM MILLER
Attorney General of Iowa
1035 E. Walnut Street
Des Moines, IA 50319

DOUGLAS F. GANSLER
Attorney General of
Maryland
200 Saint Paul Place
Baltimore, MD 21202

MIKE MCGRATH
Attorney General of
Montana
P.O. Box 201401
Helena, MT 59620

NANCY H. ROGERS
Attorney General of Ohio
30 East Broad St., 17th Fl.
Columbus, OH 43215

W.A. DREW EDMONDSON
Attorney General of
Oklahoma
313 N.E. 21st Street
Oklahoma City, OK 73105

SUSAN SHINKMAN
Chief Counsel
Pennsylvania Department of
Environmental Protection
Richard P. Mather
Deputy Chief Counsel
400 Market Street
Harrisburg, PA 17105

ROBERTO J. SANCHEZ-RAMOS
Secretary of Justice
Commonwealth of
Puerto Rico
P.O. Box 9020192
San Juan, PR 00902-0192

AMICUS CURIAE BRIEF

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In The
Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, et al.,
Respondents,

PSEG FOSSIL, LLC, *et al.*,
Petitioner,

v.

RIVERKEEPER, INC., *et al.*,
Respondents,

UTILITY WATER ACT GROUP,
Petitioner,

v.

RIVERKEEPER, INC., *et al.*,
Respondents.

On Writs of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF OF AMICUS CURIAE NATIONAL ASSOCIATION OF HOME BUILDERS SUPPORTING PETITIONERS

Duane J. Desiderio
Thomas J. Ward
National Association of Home Builders
1201 15th Street, N.W.
Washington, D.C. 20005
(202) 266-8200

Daniel P. Albers*
**Counsel of Record*
Jeffrey S. Longsworth
David T. Ballard
Barnes & Thornburg LLP
One North Wacker Drive
Suite 4400
Chicago, IL 60606-2809
(312) 357-1313

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INTEREST OF *AMICUS CURIAE*

The National Association of Home Builders ("NAHB") has received the parties' written consent to file this *amicus curiae* brief supporting Petitioners.[1] NAHB represents over 235,000 builder and associate members throughout the United States, including individuals and firms that construct and supply single-family homes, as well as apartment, condominium, multi-family, commercial and industrial builders, land developers and remodelers. As part of the construction and development process, its members commonly obtain Clean Water Act ("CWA") permits that must conform to any applicable effluent limitations and guidelines under sections 301 and 304 of the Act. NAHB has developed comprehensive familiarity with the CWA's permitting requirements and provides compliance advice to its members.

NAHB frequently participates as a party litigant and *amicus curiae* to safeguard the rights and interests of its members. NAHB was a petitioner in a CWA case, *NAHB v. Defenders of Wildlife*, 551 U.S. ---, 127 S.Ct. 2518 (2007). Attached at Appendix A to this brief is a list of cases in which NAHB has participated before this Court as an *amicus curiae* or "of counsel," in a number of matters involving landowners aggrieved by over-zealous regulation

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[1] Letters of consent are on file with the Clerk. Pursuant to Rule 37.6 of this Court, *amicus* states that their counsel authored this brief. The brief was not written in whole or part by counsel for a party, and no one other than *amicus* made a monetary contribution to its preparation.

under a wide array of statutes and regulatory programs.

The question presented rests on interpretation of CWA section 316(b), concerning the technology that must be used to control effluent from cooling water intake structures. In construing section 316(b), the court of appeals has confused more than 30 years of case law interpreting other CWA sections that have more pertinence to the home building process, and has needlessly exposed those sections to new legal challenges. NAHB submits this brief to ensure that, regardless of whether the Court reverses or affirms, the scope of any decision here is limited to interpreting only CWA § 316(b), and does not disturb well-established precedent interpreting other CWA provisions that more directly regulate construction and development of housing.

SUMMARY OF ARGUMENT

The issue before the court of appeals was how to interpret a unique technology standard set forth by Congress in CWA section 316(b)—the "best technology available for minimizing adverse environmental impact" ("BTA")—for regulating cooling water intake structures at large, existing power plants.[2] Instead of conducting a proper *Chevron* analysis, the Second Circuit interpreted section 316(b) by borrowing interpretations of sections 301 and 306. In doing so, the Second Circuit wrongly interpreted sections 301 and 306, finding that those

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[2] The Second Circuit decision is reported as *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d. Cir. 2007).

provisions did not permit EPA to weigh costs and benefits in analyzing the "best available technology economically achievable" ("BAT") for setting effluent limitation guidelines, and the "best available demonstrated control technology" ("BADT") for setting new source performance standards, for industrial discharges.

The court below substituted its own interpretation of the section 316(b) for that of the agency. Under *Chevron*, the Second Circuit should have recognized that section 316(b) is ambiguous and deferred to EPA's reasonable interpretation of the phrase "best technology available for minimizing adverse environmental impact."

ARGUMENT

I. THROUGHOUT THE CLEAN WATER ACT CONGRESS VARIED TECHNOLOGY STANDARDS TO CONTROL EFFLUENT, AND THE DEGREE TO WHICH COST IS CONSIDERED WHEN ESTABLISHING THOSE TECHNOLOGIES.

A. Varying Technology Standards.

The question presented is whether EPA is authorized to conduct a cost-benefit analysis under section 316(b), in determining the applicable technology for cooling water intake structures. Section 316 covers "thermal discharges," and subsection (b) provides:

> Any standard established pursuant to [CWA sections 301 or 306] ... and applicable to a

> point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the *best technology available for minimizing adverse environmental impact.*

33 U.S.C. § 1326(b) (emphasis supplied). The Court must decide whether the words "best technology available for minimizing adverse environmental impact" ("BTA"), confer upon EPA the discretion to weigh costs and benefits when setting the applicable effluent control technology for cooling water intake structures. As discussed below, unlike other technology-setting provisions in the CWA, section 316(b) nowhere describes, defines, or lists the factors that EPA should use to define BTA. To flesh-out this congressional silence regarding water cooling intake technology, the court of appeals placed too much reliance on the factors set forth in sections 301, 304 and 306, concerning the effluent technologies for other types of pollutants and pollutant sources. An analysis of some of these other technology standards is instructive.

As a general matter, section 301(a) makes it illegal to discharge[3] any pollutant except in compliance with various provisions in the Act. 33 U.S.C. §§ 1311(a). One of those provisions that makes a discharge permissible is section 301(b), which sets a timetable for EPA to establish "effluent limitations" on point sources. *Id.* § 1311(b). These effluent limitations are

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[3] "Discharge of a pollutant" is defined as "(A) any addition of any pollutant to navigable waters from any point source ...." 33 U.S.C. § 1362(12)(A).

afforded regulatory effect through EPA's adoption and periodic revision of "effluent limitation guidelines" ("ELGs"), as provided in section 304(b), which among other things describes factors for the Agency to consider when establishing technologies to control various pollutant discharges. *Id.* § 1314(b). Similarly, under section 306, EPA must publish and periodically revise regulations establishing "national standards of performance" for certain categories of industrial sources enumerated in the statute, as well as new industrial sources that EPA determines should be regulated. *Id.* § 1316. In these various provisions, Congress used different technological standards to control effluent depending on whether the industrial source is new or existing, the type of pollutant at issue, and the effective date by which EPA was to promulgate new regulations.

For example, by July 1, 1977, EPA was to establish effluent limitations based on the "best practicable control technology currently available" ("BPT") for existing sources discharging pollutants (other than publicly owned treatment works). Section 301(b)(1)(A); *id.* § 1311(b)(1)(A). Then, by March 31, 1989, newer technology standards were to govern depending on whether the pollutant of concern was conventional, toxic, or non-conventional. By March 31, 1989, existing sources of conventional pollutants[4] were to be subject to effluent limitations applying

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[4] "Conventional pollutants" include biological oxygen demand, suspended solids (such as sediment), fecal coliform, and pH, and additional pollutants that EPA determines are conventional. 33 U.S.C. § 1314(a)(4). For example, EPA designated oil and grease as an additional conventional pollutant. 44 Fed. Reg. 44,501 (July 30, 1979).

"the best conventional pollutant control technology" ("BCT"). Section 301(b)(2)(E); *id.* § 1311(b)(2)(E).[5] By that same date, a different technology standard—the "best available technology economically achievable" ("BAT")—was to govern effluent limitations from existing sources of toxic and non-conventional pollutants. Section 301(b)(2)(A) (setting BAT standard); sections (b)(2)(C), (D) (1989 deadline for toxics); section (b)(2)(F) (1989 deadline for non-conventional pollutants). *Id.* §§ 1311(b)(2)(A), (C), (D) & (F).[6] Effluent limitations set forth pursuant to the BAT standard "shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him . . . that such elimination is technologically and *economically achievable* for a category or class of point sources as determined in accordance with regulations issued by the Administrator ...." Section 301(b)(2)(A); *id.* § 1311(b)(2)(A) (emphasis supplied).

Further, for appropriate *new* pollutant sources, Congress set different technology-based levels to control effluent. The Act authorizes EPA to set new source performance standards ("NSPS") "which reflect[] the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available

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[5] 33 U.S.C. § 1311(b)(2)(E) references § 1314(b)(4), which pertains to conventional pollutants.

[6] 33 U.S.C. § 1311(b)(2)(A) references subsections (C) and (D) which pertain to certain toxic pollutants. Subsection (b)(2)(A) also references subsection (F), for "all" remaining pollutants not covered elsewhere in subparagraph (2) (*i.e.*, non-conventional pollutants, which are neither conventional or toxic).

demonstrated control technology"—that is, "BADT." Sections 306(a)(1), (2); *id.* §§ 1316(a)(1), (2).

B. Varying Cost-Benefit Considerations Relative to Different Technology Standards.

The extent to which EPA must use economic and cost considerations, when establishing these different technology standards to control effluent, varies. Sometimes Congress explicitly directed EPA to consider cost; sometimes Congress provided that cost was a factor EPA may consider; sometimes Congress said nothing at all about cost. In other words, while the Act does not specifically define the various technology standards, it generally (but not always) enumerated specific factors EPA must consider in setting effluent limitation guidelines—and sometimes these include cost.

For example, under the initial BPT standard that was to be in effect by 1977, the Act directs that "[f]actors" EPA "shall" consider include, among other things, "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." Section 304(b)(1)(B); *id.* § 1314(b)(1)(B). Similarly, for the BCT standard to be in effect by 1989 regarding existing sources of conventional pollutants, a "factor[]" EPA "shall include" in setting effluent limitation guidelines is "consideration of the reasonableness of the relationship between the cost of attaining a reduction in effluents and the effluent reduction benefits derived ...." Section 304(b)(4)(B); *id.* § 1314(b)(4)(B). EPA has adopted regulations describing the "cost-

reasonableness" test it applies to determine BCT limitations. See 51 Fed. Reg. 24,974 (July 9, 1986).

For BAT regarding existing sources of toxic and non-conventional pollutants, section 304(b)(2)(B) does not mandate that EPA compare costs to benefits related to reductions in effluent discharges. *Id.* § 1314(b)(2)(B). Rather, that section leaves the weighing of enumerated factors, including "the cost of achieving such effluent reduction ...," to EPA's discretion. *Id.* See *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 516 (2d Cir. 2005); *Tex. Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 928 (5th Cir. 1998); *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 796 (6th Cir. 1995). EPA's view is that it "retains considerable discretion in assigning the weight accorded" to the statutory factors used to evaluate BAT, which includes the cost of achieving toxic and non-conventional effluent reductions. 71 Fed. Reg. 76,644, 76,646-47 (Dec. 21, 2006) ("Notice of Availability of Final 2006 Effluent Guidelines Program").

Similarly, Congress provided that in establishing new source performance standards ("NSPS"), EPA "shall take into consideration the cost of achieving such effluent reduction . . ." Section 306(b)(1)(B); *id.* § 1316(b)(1)(B). As EPA has stated, "[i]n establishing NSPS, [it] is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements." 71 Fed. Reg. at 76,647 (Dec. 21, 2006).

CWA § 316(b) –the cooling water intake provision at issue in the case at bench—is significantly

different in scope and intent compared to these other sections. Section 316(b) includes a cross-reference to sections 301 and 306, but Congress did not equate or otherwise compare the disparate technology standards in these provisions. But it is evident that the text in section 316(b) is markedly different from the text in section 301. Section 316(b) requires "best technology available for minimizing adverse environmental impact"—language far different from section 301's "best available technology economically achievable" for existing sources of toxic and non-conventional pollutants. Compare *id.* § 1326(b) to *id.* § 1311(b)(2)(A). The focus of these respective provisions, on their face, is plainly dissimilar; section 316(b) focuses on environmental impacts, while section 301 focuses on economic achievability. EPA recognized the differences in exercising its discretion for the cooling water intake structure rule at issue, interpreting the phrase "minimizing adverse environmental impact" to define what constitutes "best" and "available" under section 316(b):

> Section 316(b) requires that cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. *In contrast to the effluent limitations provisions* [of section 301], the object of the "best technology available" is explicitly articulated by reference to the receiving water: To minimize adverse environmental impact in the waters from which cooling water is withdrawn.

69 Fed. Reg. 41,576, 41,583 (July 9, 2004).

The various technology standards discussed above, the scope of their application, and pertinent statutory language regarding cost, are tabulated below:

Acronym	Technology Standard	CWA Section	Scope of Application	Cost Considerations
BPT	Best Practicable Control Technology Currently Available	Section 301(b)(1)(A); 33 U.S.C. § 1311(b)(1)(A)	By July 1, 1977, effluent limitations were to reflect BPT for "classes and categories of point sources ...." That is, BPT applies to discharges of conventional, nonconventional, and toxic pollutants.	EPA "shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved ...." § 304(b)(1)(B); 33 U.S.C. § 1314(b)(1)(B).
BCT	Best Conventional Pollution Control Technology	Section 304(b)(2)(E); 33 U.S.C. § 1311 (b)(2)(E)	By March 31, 1989, effluent limitations were to reflect BCT for conventional pollutants.	"Factors" relating to EPA's assessment of BCT "shall include consideration of the reasonableness of the relationship between the costs of a attaining a reduction in effluents and the effluent reduction benefits derived ...." § 304(b)(4)(B); 33 U.S.C. § 1314(b)(4)(B).

Acronym	Technology Standard	CWA Section	Scope of Application	Cost Considerations
BAT	Best Available Technology Economically Achievable	Sections 301(b)(2)(A), (C), (D), (F); 33 U.S.C. §§ 1311(b)(2)(A), (C),(D),(F)	By March 31, 1989, effluent limitations were to reflect BAT for toxic pollutants, and for all other (*i.e.*, non-conventional) pollutants.	One "[f]actor" EPA "shall take into account" is "the cost of achieving such effluent reduction ...." § 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B).
BADT	Best Available Demonstrated Control Technology	Sections 306(a)(1), (b)(2)(B); 33 U.S.C. § 1316(a)(1), (b)(2)(B)	New source performance standards ("NSPS")	EPA "shall take into consideration the cost of achieving such effluent reduction ...." § 306(b)(2)(B); 33 U.S.C. § 1316(b)(2)(B).
BTA	Best Technology Available for Minimizing Adverse Environmental Impact	Section 316(b); 33 U.S.C. § 1326(b)	Location, design and construction of cooling water intake structures	Not explicit.

II. THE COURT OF APPEALS' ANALYSIS OF COST CONSIDERATIONS REGARDING THE VARIOUS TECHNOLOGY STANDARDS IS FLAWED.

A. The Court of Appeals' Analysis Placed Undue Weight on Sections 301 and 306 Which are Far Broader in Scope than Section 316, Which Deals *Only* With Cooling Water Intake Structures.

In interpreting section 316(b) to determine if it authorized EPA to conduct a cost-benefit analysis for cooling water intake structures, the court of appeals relied on unnecessary extrapolations of sections 301 and 306. It stated, "[o]ur interpretation of section 316(b) is informed by the two provisions it cross-references, CWA sections 301 and 306." *Riverkeeper, Inc.*, 475 F.3d at 90. Indeed, the Second Circuit assessed the "Cost Analysis Pursuant to Sections 301 and 306," because section 316(b) "does make specific reference to CWA sections 301 and 306, which we have taken previously as 'an invitation' to look to those sections for guidance in 'discerning what factors Congress intended the EPA to consider in determining' BTA." *Id.* at 97 (quoting *Riverkeeper, Inc. v. EPA*, 358 F.3d 174, 186 (2d Cir. 2004). The Second Circuit conducted this analysis, despite the fact that it also acknowledged that "Section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that the EPA must consider in determining BTA." *Id.*

The court of appeals recognized that in 1989, when the BPT standard was replaced by the BAT standard,

section 301(b)(2)(A) authorized EPA to consider "the cost of achieving such effluent reduction" in determining BAT. *Riverkeeper*, 475 F.3d at 97 (quoting 33 U.S.C. § 1314(b)(2)(B)). The lower court further stated that in contrast to the older BPT standard, "[i]n determining BAT ... the EPA may consider cost as a factor to a limited degree, ... but only as to whether the cost of a given technology could be reasonably borne by the industry and not the relation between that technology's cost and the benefits it achieves." *Id.* at 98. Thus, the Second Circuit held that EPA could only conduct a "cost-effectiveness" analysis for determining BAT. *Id.* at 98.

The lower court also briefly examined section 306. It recognized that new source performance standards under that section must reflect BADT. *Id.* It further found that "Congress provides that in establishing standards of performance, the EPA 'shall take into consideration the cost of achieving such effluent reduction,' ... but did not require the EPA to conduct cost-benefit analysis." *Id.* (quoting 33 U.S.C. § 1316(b)(1)(B)). Thus, the Second Circuit held that for both sections 301 and 306, "after 1989, cost is a lesser, more ancillary consideration in determining what technology the EPA should require for compliance under those sections." *Id.* The court of appeals concluded that "[t]he shift from the BPT standard to the more stringent BAT one clearly signaled Congress's intent to move cost consideration under the CWA from cost-benefit analysis to a cost-effectiveness one." *Id.* The Second Circuit thus found that its analysis "strongly suggests" that EPA is not

authorized to conduct a cost-benefit analysis under sections 301 and 306. *Id.*

The court of appeals drew questionable inferences from section 301 (which pertains broadly to existing sources across the spectrum of conventional, non-conventional, and toxic pollutants) and from section 306 (which pertains generally to new sources of effluent discharge). However, the only provision before it to consider was section 316(b), which imposes a technology standard uniquely applicable to cooling water intake structures. As shown below, it was erroneous for the court of appeals to use sections 301 and 306 to conclude that EPA was precluded from conducting a cost-benefit analysis in determining BADT.

B. Contrary to the Court of Appeals' Interpretation, Congress Authorized Cost-Benefit Analysis to Establish Technology Standards Under Sections 301, 304 and 306.

Under sections 301, 304, and 306, EPA is plainly authorized to evaluate cost considerations for BAT and BADT. The court of appeals was wrong to state otherwise.

As noted, in attempting to divine the meaning of section 316(b) for BTA regarding cooling water intake structures, the court of appeals stated that sections 301 and 306 "informed" its analysis. *Riverkeeper,* 475 F.3d at 90. The CWA's very language in section 301(b)(2)(A), which sets forth the BAT standard applicable to existing sources of toxic and non-

conventional pollutants, explicitly provides that EPA take costs and economic feasibility into account for assessing the "best available technology *economically achievable*." 33 U.S.C. § 1311(b)(2)(A) (emphasis added). On its face, the very premise of the BAT standard depends on whether the technology can be achieved *at all*, in light of cost; the text does not predicate BAT on cost efficiencies, and does not describe BAT as the "best available and most efficient" method to control toxic or non-conventional effluent. Further, Congress expressly provided that EPA can consider numerous factors for BAT, including "the cost of achieving such effluent reduction ...," as well as "such other factors as the Administrator deems appropriate ...." *Id.* § 1314(b)(2)(B). And in similar language for new source performance standards, section 304(b)(1)(B) likewise states that EPA can consider "the cost of achieving such effluent reduction . . ." 33 U.S.C. § 1316(b)(1)(B).

Thus, under the plain text of the provisions to which the lower court turned for guidance, it was inappropriate to conclude that EPA may not conduct cost-benefit analyses for the BAT and BADT standards. Moreover, the lower court was selective in the statutory sections it chose to examine. While it *said* it would look to section 301 and went on to consider subsection (b)(2)*(A)*, it totally *ignored* subsection (b)(2)*(E)*, which sets the BCT standard for existing sources of conventional pollutants. See *id.* § 1311(b)(2)(E). And, Congress indisputably directed EPA to weigh costs against when establishing BCT effluent guidelines. The Act directs that "[f]actors" relating to EPA's assessment of BCT "shall include consideration of the reasonableness of the

relationship between the *costs* of a attaining a reduction in effluents and the effluent reduction *benefits* derived ...." See *id.* § 1314(b)(4)(B) (emphasis supplied). Indeed, EPA has adopted regulations describing the "cost-reasonableness" test it uses when establishing BCT limitations for industrial point sources discharging conventional pollutants. See 51 Fed. Reg. 24,974 (July 9, 1986).

Other courts have not taken the selective or restrictive approach used here by the court of appeals. They have found that EPA has the discretion to (and does) evaluate costs in setting technology standards under sections 301 and 306. *See BP Exploration & Oil*, 66 F.3d at 796 ("NRDC is wrong to contend that EPA is not permitted to balance factors such as cost against effluent reduction benefits"); *Waterkeeper Alliance*, 399 F.3d at 516 ("if the EPA determines, with adequate support in the record, that a given set of costs cannot reasonably be borne by a given industry, courts must defer to that determination"); *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 570 (D.C. Cir. 2002) ("appellate courts give EPA considerable discretion to weigh and balance the various factors required by statute to set NSPS"); *Tex. Oil & Gas*, 161 F.3d at 928 (5th Cir. 1998) ("The EPA . . . has considerable discretion in evaluating the relevant factors and determining the weight to be accorded to each in reaching its ultimate BAT determination.").

Thus, under sections 301, 304 and 306, EPA is afforded wide discretion to place significant weight to cost considerations. The agency is authorized, but not required, to assess those costs in relation to benefits when determining BAT and BADT. The court of

appeals' decision that EPA is *prohibited* from assessing costs for these technologies is unprecedented and should be reversed.

C. The Court of Appeals Misinterpreted This Court's Decision in *EPA v. Nat'l Crushed Stone Ass'n.*

The court of appeals relied on *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64 (1980), to assert that EPA is prohibited from conducting a cost-benefit analysis for BAT. But its interpretation of that case was erroneous. In examining the factors that EPA can evaluate for BPT and BAT, this Court first found that EPA must consider the various factors for adopting effluent limitation guidelines under section 304(b)(1)(B). *Id.* at 70. The Court then decided that the factors under section 304(b)(2)(B) to determine BAT do not *mandate* that EPA conduct a cost-benefit assessment, as is required for BPT. *Id.* at 71. The Court stated that "Section 304(b)(2)(B) lists 'cost' as a factor to consider in assessing BAT, although *it does not state that costs shall be considered in relation to effluent reduction.*" *Id.* at 71, n.10 (emphasis added).

The court of appeals, however, misinterpreted *National Crushed Stone*, by construing the lack of a mandate to compare costs and benefits under section 304(b)(2)(B) as a blanket *prohibition* against such analysis. The lower court should have followed the Fifth Circuit's opinion in the *Texas Oil & Gas* case, which correctly explained that *National Crushed Stone* stands only for the proposition that "EPA is *not obligated* to evaluate . . . the relationship between costs and benefits." *Tex. Oil & Gas*, 161 F.3d at 936

(citing *Nat'l Crushed Stone*, 449 U.S. at 71) (emphasis added).

D. The Court of Appeals' *Chevron* Analysis was Incorrect.

In the end, the court of appeals should have conducted a proper *Chevron* analysis of section 316(b) and deferred to EPA's reasonable interpretation of that provision. As it admitted, "Section 316(b) does not itself set forth or cross-reference another statutory provision enumerating the specific factors that the EPA must consider in determining BTA." *Riverkeeper*, 475 F.3d at 97. Under a correct *Chevron* analysis, the Second Circuit's admission that the language of the statute was silent should have mobilized it to move on to "Step 2," and assess whether EPA's interpretation of section 316(b), a statute that the agency administers, was reasonable. *Chevron U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837, 842-43 (1984) (If a "statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute"). Moreover, section 316(b)'s cross-reference to sections 301 and 306, at best, creates an ambiguity which should have triggered deference to EPA's interpretation. *Envtl. Def. v. Duke Energy Corp.*, 549 U.S. 561, 127 S. Ct. 1423, 1433 (2007) (a "cross-reference alone is certainly no unambiguous congressional code for eliminating the customary agency discretion to resolve questions about a statutory definition ....")

The lower court opinion guts the bedrock principle that where a statute is silent as to the question at issue, "a court may not substitute its own

construction of a statutory provision for a reasonable interpretation made by the administrator of an agency." *Chevron*, 476 U.S. at 844. Instead of deciding whether EPA's interpretation of section 316(b) was a permissible construction of the statute, it leaped to sections 301 and 306—provisions with different language, purposes, and far broader purviews than cooling water intake structures. As thoroughly discussed by the other parties' briefs, EPA's construction of section 316(b) was reasonable, and thus, the Second Circuit should have deferred to that fair construction.

The court of appeals' overly-heavy reliance on sections 301 and 306, when interpreting section 316(b), was certainly misplaced. Even though these sections must by their very nature share some of the same words, the Court has recognized that the same words can have different meanings when used in different contexts of the same statute:

> [M]ost words have different shades of meaning and consequently may be variously construed, not only when they occur in different statutes, but when used more than once in the same statute or even in the same section.

Envtl. Def., 127 S. Ct. at 1432 (2007) (citation omitted). Indeed, although BTA and BAT share similar words, those words appear in different contexts. Section 304's BAT standard refers to the "best available technology *economically achievable*" in section 301. 33 U.S.C. §§ 1314(b)(2)(B) & 1311(b)(2)(A) (emphasis added). In contrast, section 316(b) provides for standards that reflect the "best technology available for minimizing adverse

environmental impact." 33 U.S.C. § 1326(b). Based on the plain language of the provisions, section 301's terms focus on technological and economic feasibility, while section 316(b)'s terms focus on minimizing adverse impacts—two dissimilar goals.

Because the Second Circuit rendered a decision that is inconsistent with prior case law, failed to conduct a proper *Chevron* analysis, and failed to recognize the differences in language between statutory provisions, this Court should reverse.

CONCLUSION

For the foregoing reasons, the judgment below should be reversed.

Respectfully submitted,

July 18, 2008

Duane J. Desiderio
Thomas J. Ward
NATIONAL
ASSOCIATION OF
HOME BUILDERS
1201 15th Street, N.W.
Washington, D.C. 20005
(202) 266-8200

Daniel P. Albers
Counsel of Record
Jeffrey S. Longsworth
David T. Ballard
BARNES &
THORNBURG LLP
One North Wacker Drive
Suite 4400
Chicago, IL 60606-2809
(312) 357-1313

APPENDIX A

Cases in which NAHB has appeared as an *amicus curiae* or "of counsel" before this Court include:

Agins v. City of Tiburon, 447 U.S. 255 (1980); *San Diego Gas and Elec. Co. v. City of San Diego*, 450 U.S. 621 (1981); *Williamson County Reg'l Planning Comm'n v. Hamilton Bank*, 473 U.S. 172 (1985); *MacDonald, Sommer & Frates v. Yolo County*, 477 U.S. 340 (1986); *First English Evangelical Lutheran Church v. Los Angeles County*, 482 U.S. 304 (1987); *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825 (1987); *Pennell v. City of San Jose*, 485 U.S. 1 (1988); *Yee v. City of Escondido*, 503 U.S. 519 (1992); *Lucas v. S.C. Coastal Council*, 505 U.S. 1003 (1992); *Dolan v. City of Tigard*, 512 U.S. 374 (1994); *Babbitt v. Sweet Home Chapter of Cmtys. for a Greater Ore.*, 515 U.S. 687 (1995); *Suitum v. Tahoe Reg'l Planning Agency*, 520 U.S. 725 (1997); *City of Monterey v. Del Monte Dunes at Monterey, Ltd.*, 526 U.S. 687 (1999); *Solid Waste Agency of N. Cook County v. U.S. Army Corps of Eng'rs*, 531 U.S. 159 (2001); *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001); *Franconia Assocs. v. United States*, 536 U.S. 129 (2002); *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302 (2002); *Borden Ranch P'ship v. U.S. Army Corps of Eng'rs*, 537 U.S. 99 (2002); *City of Cuyahoga Falls v. Buckeye Cmty. Hope Found.*, 538 U.S. 188 (2003); *S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95 (2004); *San Remo Hotel, L.P. v. City and County of San Francisco*, 545 U.S. 323 (2005); *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (2005); *Kelo v. City of New London*, 545 U.S. 469 (2005); *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547

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AMICUS CURIAE BRIEF

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Nos. 07-588, 07-589 and 07-597

Supreme Court, U.S.
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IN THE

Supreme Court of the United States

ENTERGY CORPORATION,
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*,

PSEG FOSSIL LLC, *et al.*,
Petitioners

v.

RIVERKEEPER, INC., *et al.*,

UTILITY WATER ACT GROUP,
Petitioner

v.

RIVERKEEPER, INC., *et al.*

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

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AMICUS CURIAE BRIEF OF NATIONAL WILDLIFE FEDERATION AND SIERRA CLUB IN SUPPORT OF RESPONDENTS RIVERKEEPER, INC., ET AL.

DAVID K. MEARS *
ENVIRONMENTAL AND NATURAL RESOURCES LAW CLINIC
VERMONT LAW SCHOOL
P.O. Box 96
South Royalton, Vermont 05068
(802) 831-1627

* Counsel of Record

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INTEREST OF AMICI

Amici Curiae are non-profit organizations committed to protecting our Nation's waters for the use and enjoyment of their members.[1] Collectively, these organizations work to foster public understanding of and participation in solutions to the problems resulting from human impacts on rivers, lakes, bays, estuaries and oceans. Amici Curiae seek to promote the objective of the Clean Water Act ("the Act") to restore and maintain the chemical, physical, and biological integrity of the nation's waters, as well as its national goal to ensure the protection and propagation of fish, shellfish, and wildlife.

Based upon these interests, these groups join in filing this brief in support of Respondents' efforts to invalidate the United States Environmental Protection Agency's (EPA's) regulations for cooling water intake structures at large, existing power plants. Amici curiae ask this Court's ruling that EPA may not, in light of the complex and significant impacts of cooling water intake structures on aquatic ecosystems, employ cost-benefit analysis when making a "best technology available" determination under Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b).

SUMMARY OF ARGUMENT

EPA cannot accurately quantify the benefit of minimizing the environmental impacts of once-

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[1] Pursuant to S. Ct. R. 37.3(a) and 37.6, the undersigned represents that (1) all parties consented to the filing of this brief, (2) no counsel for any party authored this brief in whole or part, and (3) no person or entity other than the above-named amici curiae and their counsel made a monetary contribution to the preparation or submission of this brief.

through cooling water systems on aquatic ecosystems because of the uncertainty inherent in measuring those impacts. Agencies using cost-benefit analysis in this context will inevitably fail to properly consider the loss of ecological integrity and other important values. *Amici National Wildlife Federation et al.* offer a summary of the ecological impacts of cooling water intake structures to illustrate why it was a sensible policy choice for Congress to require power plants to install the best technology available to minimize these impacts, independent of any cost-benefit analysis.

Power plants using once-through cooling water systems draw extremely large volumes of water into their cooling water systems and, in the process, destroy innumerable numbers of fish, shellfish, and other aquatic or water-dependent organisms. All of these organisms, whether a highly sought-after commercially valuable fish or a "lowly" worm, play an important ecological role in the rivers, lakes, bays and estuaries from which they are removed. These waters are already stressed by pollution and other human activities and so the significant loss of aquatic life can have far-reaching impacts not readily measured, including fundamental shifts in ecosystem structure and function.

Congress established the "best technology available for minimizing adverse environmental impacts" (BTA) standard precisely because of the difficulty of determining the full benefits of restoring water bodies impacted by cooling water systems. The use of cost-benefit analysis is wholly inconsistent with "minimizing" environmental effects and does not allow for the proper consideration of the values underlying the Clean Water Act's objective to restore and maintain

aquatic ecosystems. Congress' use of a technology-forcing standard in Section 316(b) is therefore a rational policy choice.

ARGUMENT

I. Once-through Cooling Water Systems Cause Serious Harm to the Ecological Integrity of Our Nation's Waters

The Second Circuit correctly concluded that the ecological impacts of cooling water intake structures through entrainment and impingement are "staggering." *Riverkeeper, Inc. v. U.S. Environmental Protection Agency*, 358 F.3d 174, 181 (2d Cir. 2004). The volume of water used for cooling water at power plants is vast. The United States Geological Survey (USGS) has estimated the total quantity of water withdrawn for electric power in the year 2000 to be 195 billion gallons per day.[2] Of all the various sources that withdraw water from our nation's waters, thermoelectric power withdrawals accounted for over fifty percent of fresh surface-water withdrawals and over ninety percent of saltwater surface water withdrawals.[3]

The direct impacts of the once-through cooling water systems include the death of over three billion fish and shellfish per year[4] and the removal of

---

[2] Hutson, et al., *Estimated Use of Water in the United States in 2000*, USGS Circular 1268 (released March 2004, revised April 2004, May 2004, February 2005) (*Available at* http://water.usgs.gov/watuse/).

[3] *Id.*

[4] This number is expressed as an "age 1 equivalent" which is the method EPA used in its analysis for establishing an "apples to apples" comparison of the losses of fish at all stages from eggs and larvae to fish older than one year old. U.S. Environmental

innumerable fish eggs, larvae, plankton, and invertebrates.[5] The removal of this many living organisms from aquatic ecosystems has other impacts more difficult to quantify. The killing and harming of so many organisms leads to a shift in the structure and health of the ecosystem including a change in the balance of species which would normally be present. Added to the other stresses on aquatic ecosystems from human activities, the use of once-through cooling water technologies has major impacts on the ecological integrity of our nation's waters.[6]

Petitioners and their amici argue that these impacts from operating once-through cooling water systems are not significant or may actually be beneficial.[7] Their argument includes the assertion

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Protection Agency, *Regional Studies for the Final Section 316(b) Phase II Existing Facilities Rule*, (February 2004) A5-4.1 (*Available at* http://www.epa.gov/waterscience/316b/phase2/casestudy/final/cha5.pdf) [hereinafter *Regional Studies*].

[5] U.S. Environmental Protection Agency, *Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule*, at Table C2-1 (February 2004) (Available at: http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm) [hereinafter *Economic and Benefits Analysis*].

[6] These impacts are discussed in more detail *infra*. Excellent summaries of the environmental effects of cooling water systems in the context of Section 316(b) can also be found in two articles: May and van Rossum, *The Quick and the Dead: Fish Entrainment, Entrapment, and the Implementation and Application of Section 316(b) of the Clean Water Act*, 20 Vt. L. Rev. 373, 378-385 (1995); and Super and Gordon, *Minimizing Adverse Environmental Impact: How Murky the Waters*, in Dixon, et al., DEFINING AND ASSESSING ADVERSE ENVIRONMENTAL IMPACT FROM POWER PLANT IMPINGEMENT AND ENTRAINMENT OF AQUATIC ORGANISMS, (2003) at 213-230.

[7] Petitioners argue, for instance, that once-through cooling systems are a better choice than alternatives which impose an

that the organisms that die from impingement and entrainment would die anyway, or that the organisms that die are merely surplus.[8] Petitioners even suggest that their cooling water systems are beneficial because they remove nuisance species.[9] These arguments fail not just because they lack scientific support, but also because they rely on an overly narrow view of the importance of the organisms killed, a perspective that ignores the interconnectedness of life in aquatic ecosystems.

"energy penalty" on power plants. In this brief, since this case involves application of the Clean Water Act, we have only considered the impacts of once-through cooling water systems on aquatic ecosystems as the relevant "adverse environmental impact." Petitioners' attempts to broaden the relevant inquiry by asserting that requiring power plants to replace once-through with closed-cycle cooling water systems would increase carbon dioxide emissions presents an interesting but fundamentally flawed argument. Petitioners' argument rests on the shaky assumption that the extra power required to run a closed-cycle cooling system would have to be replaced, and that the replacement energy would have to come from carbon-dioxide emitting power plants. This self-serving assumption conveniently ignores the likelihood that the additional cost associated with reducing the impacts of impingement and entrainment would drive reduced consumption, increased efficiency, and more reliance on renewable sources of electricity.

[8] Brief of Petitioners Entergy Corp, PSEG Fossil LLC and PSEG Nuclear LLC at 49-51, Entergy Corp. v. EPA, et al. (July 14, 2008). . *See also* Brief of Petitioner Utility Water Act Group at 8-9, Entergy Corp. v. EPA, et al. (July 14, 2008).

[9] Brief of Petitioners Entergy Corp, et al. *supra* note 8, at 23. *See also* Brief of Petitioner Utility Water Act Group, *supra* note 8, at 10.

A. The Harm to Aquatic Ecosystems from Once-through Cooling Water Systems is Significant and Complex

1. Impingement and Entrainment by Once-through Cooling Water Systems Kills or Injures Large Numbers of Many Different Water-Dependent Species

Power plants kill or harm a broad array of organisms in their cooling water intake structures in two primary ways, through "impingement" and "entrainment."[10] The term "impingement" refers to a circumstance in which the fish or other organism, larger than the apertures in the screen used to keep debris out of the cooling water system, is trapped against the screen by the pressure of the water flowing through the structure such that it suffers physical harm or is killed.[11] Impinged fish may suffocate if they cannot pass water over their gills due to high water pressure.[12] Also, contact with the cooling system equipment can abrade the scales and skin of the fish increasing their susceptibility to infection and osmotic stress.[13]

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[10] *Economic and Benefits Analysis*, *supra* note 5 at A2-4.

[11] *Id.*

[12] U.S. Environmental Protection Agency, *Regional Analysis Document for the Final Section 316(b) Phase II Existing Facilities Rule* A2-9 (February 12, 2004) (*Available at* http://www.epa.gov/waterscience/316b/phase2/casestudy/final.htm) [hereinafter *Regional Analysis*].

[13] *Id.* at A2-8 ("Osmotic stress" refers to the potential for freshwater fish to suffer from excessive water uptake and saltwater fish to lose water.).

The term "entrainment" refers to those organisms which are not caught in the screen but instead are sucked into the cooling water system and exposed to the full range of insults that occur within that system ranging from physical harm from being battered by the turbulence, to exposure to chemicals used for cleaning the system, to abrupt temperature fluctuations.[14] Once entrained, the organisms are subjected to "mechanical and hydraulic shocks (e.g. pressure changes, abrasion of particles, impacts against piping, and turbulence), thermal stresses, and chemical toxicity (e.g. chlorination of cooling water)."[15]

Physical stresses, such as pressure changes from turbulence and acceleration, and physical abrasion are continuous whenever water is being pumped.[16] The air or swim bladder of larval fish are damaged when they undergo rapid pressure changes within the cooling system.[17] Abrupt thermal shocks "may disturb the normal processes in the development of early life stages of aquatic organisms, or result in death of either young or adults."[18] Chlorine (and other biocides) added to cooling water systems "seriously affects the growth and survival of entrained organisms" with "substantial damage to entrained plankton[19] even at very low chlorine dosages."[20]

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[14] *Economics and Benefits Analysis*, *supra* note 5 at A2-4.

[15] *Id.* at A2-4,5.

[16] Schubel, et. al., *Power Plant Entrainment, 137-8* (1978).

[17] *Regional Analysis*, *supra* note 12, at A2-9.

[18] Schubel, *supra* note 16, at 22, *citing* O. Kinne, *Temperature*, *in* MARINE ECOLOGY 321-616 (1970).

[19] Plankton are generally defined as "floating organisms whose movements are more or less dependent on currents." Odum et. al., *Fundamentals of Ecology*, 161 (1971).

These stresses impact fish, eggs and larvae with large percentages of mortalities from physical harm alone.[21] Mortality of zooplankton[22] is also significant.[23] Most of these organisms die as a result of being entrained, or are so badly injured that they are susceptible to predation or cannot recover.[24]

Finally, all of these impacts are synergistic.[25] A leading scientist in this area notes that the "three classes of stresses [thermal, chemical and physical] frequently act in combination," particularly during the warmer months.[26] These various stresses either kill the entrained organisms or sufficiently weaken them that they die after being discharged or become easy prey. For this reason, most scientists and EPA have concluded that it is safest to assume that the

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[20] Morgan et. al., *Biocides, in* POWER PLANT ENTRAINMENT 123-4 (J.R. Schubel & Barton C. Marcy, Jr. eds., 1978).

[21] Schubel, *supra* note 16, at 142.

[22] Plankton can generally be divided into plant and animal subgroups. Phytoplankton are the plant-like subgroup, including organisms like algae. Zooplankton are the animal-like subgroup which grazes on phytoplankton or preys on smaller plankton and which also serves as food for higher level organisms. Odum, *supra* note 19, at 300-330. Icthyoplankton are the egg and larval stages of fish when they are drifting in the water column. *Regional Analysis*, *supra* note 12, at A3-2.

[23] Schubel, *supra* note 16, at 143-50.

[24] O'Connor et. al., *The effects of power plants on productivity of the nekton, in Estuarine Research*, Vol. 1: Chemistry, Biology and the Estuarine Ecosystem (L.E. Croin, ed., 1975). *See also* Schubel, *supra* note 16, at 137.

[25] Schubel, *supra* note 16, at 137.

[26] *Id.* at 231.

cooling water systems kill one hundred percent of the organisms which are entrained.[27]

The fish mortality rates associated with "impingement" and "entrainment" can be extremely large.[28] A significant number of fish mortality studies show losses from individual power plants of millions of fish per year.[29] For example, at a power plant in Galveston, Texas, over seven million fish were impinged in year,[30] at a plant in Connecticut, fish mortality included the loss of over two million individuals in just a period of a few months,[31] and over a ten week period, over one million fish were killed by the cooling water intake structure of a power plant on the Hudson River.[32]

Macroinvertabrates and crustaceans such as crabs, lobsters and shrimp also become impinged or entrained. The losses of smaller organisms, in terms of the numbers of individuals harmed or killed, are even

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[27] National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities 69 Fed. Reg. 41,576, 41,620 (July 9, 2004). Pet. App. 322a. ("EPA believes the current state of knowledge does not support reliable predictions of entrainment survival that would provide a defensible estimate for entrainment survival above zero at a national level.").

[28] *See* Laws, *Aquatic Pollution*, 353-356 (3rd ed. 2000), Tables 11.3 and 11.4 (summarizing data from numerous studies regarding fish loss due to impingement and entrainment).

[29] *Id. See also* Hall, et al., *Environmental Impacts of Industrial Energy Systems in the Coastal Zone*, Annual Review of Energy, 395, (November 1978) ; Clark, et. al., *Electric power plants in the Coastal Zone* (1973).

[30] *Id.*

[31] *Id.*

[32] *Id.*

greater than adult fish losses. A broad array of planktonic organisms, including algaes, zooplankton, and fish eggs and larvae which are suspended in the water column are entrained into once-through cooling water systems.[33] These organisms, while they may have some limited mobility, are largely powerless to escape the suction from cooling water intake structures.[34] Estimated losses for large power plants drawing their cooling water from estuaries can exceed one billion organisms per year.[35]

It is not just fish, crustaceans and planktonic organisms which are affected by impingement and entrainment, but also birds, sea turtles and marine mammals.[36] EPA has noted that "[m]any other kind of aquatic organisms are vulnerable to impingement and entrainment, either during early development or throughout their life cycle,"[37] including sea turtles, seals and diving birds which can die if drawn into intake structures or impinged on intake screens.[38]

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[33] U.S. Environmental Protection Agency, *Case Study Analysis for the proposed Section 316(b) Phase II Existing Facilities Rule* A3-2 (February 28, 2002) (*Available at* http://www.epa.gov/waterscience/316b/phase2/casestudy/) [hereinafter *Case Study Analysis*].

[34] *Id.* at A3-1.

[35] Kennish, *Practical Handbook of Estuarine and Marine Pollution*. 484 (1996).

[36] *Economics and Benefits Analysis*, *supra* note 5, at B6-5.

[37] *Case Study Analysis*, *supra* note 33, at A3-4.

[38] *Regional Analysis*, *supra* note 12, at A3-3, and A4-1,2.

2. Killing or Injuring Large Numbers of Water-Dependent Species Causes Far Reaching Damage to the Ecological Integrity of Our Nation's Waters

Collectively, these direct losses of fish and other organisms are by themselves dramatic. The full implications of these direct losses, however, go well beyond the loss of the individual organisms. Simple population studies and analysis are insufficient to judge the full significance of the ecological harm from impingement and entrainment. As EPA has noted, "[t]o fully appreciate the harm of once-through cooling water systems requires looking at the nature, structure and function of the ecosystem."[39] EPA summarizes the array of potential ecological impacts from cooling water intake structures, citing to well-accepted scientific literature:

> In addition to their importance in providing food and other goods of direct use to humans, the organisms lost to [impingement and entrainment] are critical to the continued functioning of the ecosystems of which they are a part. Fish are essential for energy transfer in aquatic food webs, regulation of food web structure, nutrient cycling, maintenance of sediment processes, redistribution of bottom substrates, the regulation of carbon fluxes from water to the atmosphere, and the maintenance of aquatic biodiversity (Peterson and Lubchenco, 1997;

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[39] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,292-3. (Dec. 18, 2001).

Postel and Carpenter, 1997; Holmund and Hammer, 1999; Wilson and Carpenter, 1999).[40]

A proper understanding of the impacts of impingement and entrainment at cooling water intake structures thus requires an appreciation of the complexity of aquatic ecosystems.

As a first step in understanding this complexity, it is important to appreciate the duality of every fish's role in the ecosystem: fish that are killed are not only not available as food, to people, marine mammals, birds and other fish, but are also not available to fill their own predatory role in eating other organisms. The loss of entrained organisms is a double-loss to the ecosystem since we lose both "the reproductive phases of higher forms and a loss of food organisms."[41] As noted above, the impacts of cooling water intake structures are not limited to adult fish but reach to all life stages including eggs, larvae and young fish. Similarly, when planktonic organisms are lost to the ecosystem, they cannot serve their function at the base of the food chain.[42]

Petitioners and their amici ask this Court to ignore this broad, ecological understanding of the impacts and invite instead a narrow focus, suggesting that

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[40] *Regional Analysis*, *supra* note 12, at F5-2.

[41] Schubel, *supra* note 16, at 14, *citing* Beck, et al., *Analysis of Inner Plant Passage of Estuarine Biota*, American Civil Engineering, 199-226 (1974).

[42] National Pollutant Discharge Elimination System - Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities 67 Fed. Reg. 17,122, 17,136 (April 9, 2002); *see also* National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities 66 Fed. Reg. 65,256, 65,263 (Dec. 18, 2001).

the death of these organisms is unimportant since most would have died anyway.[43] Such a narrow view ignores the fact that the organisms which are impinged or entrained would have served a variety of ecological functions. The loss of this array of organisms and life stages has a ripple effect across the ecosystem and can lead to imbalances including, contrary to the suggestion of petitioners, the proliferation of nuisance species.[44]

EPA has noted that "[i]n addition to the harm that results from the direct removal of organisms by impingement and entrainment, there are the indirect effects on aquatic food webs that result from the impingement and entrainment of organisms that serve as prey for predator species."[45] As one example

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[43] Brief of Petitioners Entergy Corp, et al., *supra* note 8, at 49-51.

[44] National Pollutant Discharge Elimination System—Regulations Addressing Cooling Water Intake Structures for New Facilities 65 Fed. Reg. 49,060, 49,075 (August 10, 2000). ("[Harmful environmental] effects could have the potential to reduce the population of indigenous species; change the species mix because some species are more susceptible to impingement and entrainment than others; might increase nuisance species; harm and kill endangered and threatened species; damage critical aquatic organisms, including important elements of the food chain; and reduce commercial and sport fisheries.") *citing* NYDEC, *Clean Water Act Section 316(b), statement provided to U.S. EPA at public meeting to discuss adverse environmental impacts resulting from cooling water intake structures*, New York State Department of Environmental Conservation, Division of Fish, Wildlife, and Marine Resources, June 29, 1998.

[45] *Economics and Benefits Analysis*, *supra* note 5, at B6-5, *see also Regional Analysis*, *supra* note 12, at A3-4, ("[m]ost aquatic organisms are also susceptible to indirect impacts as a result of the impingement or entrainment of prey items. Unfortunately,

of how far up the food chain the impacts can extend, EPA has noted that studies show indirect harm to certain bird species as a result of losses of fish and shellfish to impingement and entrainment, organisms that would otherwise be available as a food source.[46] EPA states that "[t]he impacts of [impingement and entrainment] on bird populations, though subtle cannot be discounted. Many do not realize their full reproductive potential because of loss of food resource."[47] Disruption of the food chain is, however, only one facet of the impacts of once-through cooling water systems.

The full range of public and ecological services provided by healthy water bodies is quite broad[48] and

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few studies consider how [cooling water intake structures] impact may disrupt aquatic food webs.").

[46] *Regional Analysis*, *supra* note 12, at A4-1,2.

[47] *Id.* at A4-10.

[48] EPA provides the following examples of ecological and public services disrupted by impingement and entrainment:

- decreased numbers of ecological keystone, rare, or sensitive species;
- decreased numbers of popular species that are not fished, perhaps because the fishery is closed;
- decreased numbers of special status (e.g., threatened or endangered) species;
- increased numbers of exotic or disruptive species that compete well in the absence of species lost to impingement and entrainment;
- disruption of ecological niches and ecological strategies used by aquatic species;
- disruption of organic carbon and nutrient transfer through the food web;
- disruption of energy transfer through the food web;

"many of these services can only be maintained by the continued presence of all life stages of fish and other aquatic species in their natural habitats."[49] Creating a substantial risk to these ecological services, power plant once-through cooling water systems kill disproportionate amounts of organisms in the early stages of their lives when they are most vulnerable, and also harm some species more than others. For instance, some saltwater fish are more likely to be harmed by cooling water intake structures,[50] and anadromous[51] fish may be particularly vulnerable when transitioning between their freshwater and saltwater phases.[52] Power plants are "selective predators that may not only reduce the abundance of vulnerable organisms but which may also disrupt community structure through selective cropping and concomitant enhancement of surviving

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- decreased local biodiversity;
- disruption of predator-prey relationships;
- disruption of age class structures of species;
- disruption of natural succession processes;
- disruption of public uses other than fishing, such as diving, boating, and nature viewing; and
- disruption of public satisfaction with a healthy ecosystem.

Id. at A9-1.

[49] *Id.*

[50] Versar, *Vulnerability of Biota of Freshwater (Rivers, Lakes, Reseviors) versus Marine (Tidal River, Estuary, Ocean) Habitats to Entrainment and Impingement*, (April 2002).

[51] "Anadromous fish live in the sea and migrate to fresh water to breed." Encyclopedia Britannica Online at http://www.britannica.com/ EBchecked/topic/22290/anadromous-fish.

[52] *Case Study Analysis*, *supra* note 33, at A2-9.

species."[53] The effects of impingement and entrainment thus include "changes to the community structure through changes in diversity caused by elimination of less tolerant species and life stages, and size selectivity."[54]

Appreciating the effects of selective "predation" by power plants is critical to understanding their full impact on aquatic ecosystems. The impact goes far beyond the direct mortality of large fish and includes the much broader and more difficult to assess effects of selectively removing a large component of living organisms from rivers, lakes, estuaries and oceans. Ultimately, the use of once-through cooling water systems leads to exactly the problem that Congress sought to address – a shift in the nature, structure and function of aquatic ecosystems which interferes with the recovery of the ecological integrity of our nation's waters.

B. The Cumulative Impacts of Once-through Cooling Systems Combined with Other Anthropogenic Damage Impedes Restoration of the Ecological Integrity of Our Nation's Waters

1. Once-through Cooling Water Systems Impact Aquatic Ecosystems Already Stressed from Other Human Activities

The harms from impingement and entrainment at cooling water intake structures for once-through sys-

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[53] Schubel, *supra* note 16, at 230. Contrary to Petitioners suggestion, there is no evidence that this selective cropping and enhancement preferentially removes invasive or nuisance species. *See* Brief of Petitioners Entergy Corp, et al., *supra* note 8, at 23. *See also* Brief of Petitioner Utility Water Act Group, *supra* note 8, at 10.

[54] Schubel, *supra* note 16, at 151-2.

tems do not occur in pristine waters but are instead taking place in aquatic ecosystems already struggling to maintain equilibrium. For this reason, the impacts of cooling water intake structures must be understood within the larger context of other environmental stressors including "alterations in physical habitat, modifications in the seasonal flow of water, changes in the food base of the system, changes in interactions within the stream biota, and release of contaminants (conventional pollutants)."[55]

The Clean Water Act represents an effort to deal with all of these various stressors in a comprehensive manner. Congress included provisions in the Act to address a broad array of impacts on water quality. *City of Milwaukee v. Illinois and Michigan*, 451 U.S. 304, 318 (1981)("Congress' intent in enacting the Amendments was clearly to establish an all-encompassing program of water pollution regulation."). The goals and structure of the Act make clear that Congress did not contemplate a regulatory program which involved marginal analyses of discrete harms considered independently of all other impacts. To the contrary, the broad objective of this legislation, "to restore and maintain the biological, chemical and physical integrity of the Nation's waters," 33 U.S.C.

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[55] National Academies of Science, *Assessing the TMDL Approach to Water Quality Management*, Commission on Geosciences, Environment and Resources 28-29 (2001) (discussing categories of environmental stressors on waterbodies from human activities) (*Available at* http://www.nap.edu/openbook.php?record_id=10146&page=R1) *citing* J. R. Karr, *Bioassessment and Non-Point Source Pollution: An Overview* 4-(1-18) (1990). *See also* National Research Council, *Restoration of Aquatic Ecosystems* (1992) 1-3 (*Available at* http://www.nap.edu/catalog.php?record_id=1807#toc).

§ 1251(a), reflects a desire to address all impacts on aquatic ecosystems.

EPA must, therefore, consider the overall health of our Nation's waters when determining the "best technology available for minimizing adverse environmental impacts." While it is true that there have been notable improvements in water quality in the decades following the implementation of the Clean Water Act,[56] our lakes, rivers, bays and estuaries are far from being restored. Across the nation, the states have reported significant numbers of waterbodies not meeting water quality standards.[57] Of particular relevance to this case, EPA has surveyed existing facilities with cooling water intake structures and found that ninety-nine percent of those surveyed were within two miles of waters not meeting water quality standards.[58]

The failure to achieve standards and the accompanying harms to aquatic ecosystems are due to a range of causes including erosion, mining runoff, acid rain, uncontrolled stormwater runoff, improperly managed agricultural waste, acid rain, excessive water withdrawals for irrigation, municipal sewage,

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[56] Smith et. al., *Water Quality Trends in the Nation's Rivers*, Science, March 1987, 1607 (*Available at* http://www.sciencemag.org/cgi/content/abstract/235/4796/1607?ijkey=75af02e96c5a7daded bf7eca3e340b4117cc86e8&keytype2=tf_ipsecsha).

[57] U.S. Environmental Protection Agency, *National Water Quality Inventory: Report to Congress, 2002 Reporting Cycle* (October 2007) (*Available at* http://www.epa.gov/305b/2002 report/).

[58] National Pollutant Discharge Elimination System - Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities 66 Fed. Reg. 65,256, 65,263 (Dec. 18, 2001).

industrial discharges, removal of riparian vegetation, and filling of wetlands.[59] Thermal discharges from power plants add to the ecosystem damage from these activities.[60] Federal agency reports by EPA and the United States Geologic Survey ("USGS"), and National Academies of Sciences document that water contamination from many varied pollutants is widespread[61] and includes pesticides, nutrients, salinity, acid deposition, sediment, and metals.[62] Saltwater ecosystems are not immune from this pollution.[63]

Our nation's waters have also been filled, diverted, dammed, diked, and channelized. As a result, impor-

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[59] *Id.*

[60] Laws, *supra* note 28 at 335 (3rd ed. 2000). ("Electric power plants account for 75-80% of the thermal pollution in the United States.").

[61] Hamilton, et al., *Water Quality in the Nation's Streams and Aquifers, Overview of Selected findings 1991-2001*, USGS Survey, Circular 1265 2 (2004) (*Available at* http://pubs.usgs.gov/circ/2004/1265/pdf/circular1265.pdf).

[62] *Id. See also* U.S. Environmental Protection Agency, *Wadeable Streams Assessment: A Collaborative Survey of the Nation's Streams* (December 2006) (*Available at* http://www.epa.gov/owow/streamsurvey/); U.S. Environmental Protection Agency, *National Estuary Program Coastal Condition Report* (June 2007) (*Available at* http://www.epa.gov/owow/oceans/nepccr/index.html); National Academies of Science, *Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution* (2002) (*Available at* http://books.nap.edu/catalog.php?record_id=9812#toc).

[63] U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century Final Report*, 163-84 (2004) (*Available at* http://oceancommission.gov/documents/full_color_rpt/welcome.html#full).

tant aquatic habitat has been lost, seasonal flows have been disrupted and fish passage blocked.[64]

As if that were not enough, the species native to our lakes, rivers, bays and estuaries are being outcompeted by the introduction of non-native species such as the zebra mussel in the Great Lakes,[65] and the snake-head fish in Maryland[66] – just two of the more notorious invasive species impacting our waters. In another, more systemic analysis, scientists studying the Columbia River Basin have determined that the impacts of non-native species are equivalent to other major impacts such as "habitat loss and degradation, climate change, and human population growth and development."[67] The U.S. Commission on Ocean Policy calls invasive species "one of the greatest threats to coastal environments."[68]

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[64] U.S. Fish and Wildlife Service, *Fish Passage Program*, Overview (*Available at* http://www.fws.gov/fisheries/FWMA/fishpassage/Overview.htm); *see also* Collier, M., R.H. Webb and J.C. Schmidt, U.S. Geological Survey, *Dams and Rivers: Primer on the Downstream Effects of Dams*, (1996) (*Available at* http://pubs.er.usgs.gov/pubs/cir/cir1126).

[65] U.S. Geological Survey, *Zebra Mussels Cause Economic and Ecological Problems in the Great Lakes* (2007) (*Available at* http://www.glsc.usgs.gov/main.php?content=research_invasive_zebramussel&title=Invasive%20Invertebrates0&menu=research_invasive_invertebrates).

[66] Snakehead Scientific Advisory Panel, *First Report to the Maryland Secretary of Natural Resources* (July 2002) (*Available at* http://www.dnr.state.md.us/irc/ssap_report.html).

[67] Independent Scientific *Advisory Board, Non-Native Species Impacts on Native Salmonids in the Columbia River Basin* (July 2008) (*Available at* http://www.nwcouncil.org/library/isab/isab2008-4.htm).

[68] U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century Final Report* 252-62 (2004) (*Available at*

The overharvesting of fish and shellfish presents a direct threat to the recovery of some commercially valuable or recreationally desirable species, both freshwater and saltwater. Marine fisheries in particular have suffered from overexploitation over the past thirty years with negative consequences for many fishing communities and ecosystems.[69] Further, as EPA notes, "because modern ecological studies do not typically consider the long-term historical record, existing fishery resource baselines may be inaccurate, and 'Even seemingly gloomy estimates of the global percentage of fish stocks that are overfished are almost certainly far too low.'"[70]

Finally, global warming is adding to the stress on aquatic ecosystems. The Intergovernmental Panel on Climate Change has determined that rising water temperatures associated with global warming affect algal, plankton and fish abundance.[71] This conclusion is supported by the findings of the Food and Agriculture Organization of the United Nations

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http://oceancommission.gov/documents/full_color_rpt/welcome.html#full).

[69] *Id.* at 274-303, *See also* National Research Council, Committee on Ecosystem Management for Sustainable Marine Fisheries, Ocean Studies Board, *Sustaining Marine Fisheries* 19 (1999).

[70] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,293 (Dec. 18, 2001), *citing* J.B.C. Jackson, et al., *Historical overfishing and the recent collapse of coastal ecosystems*, Science 293 (2001).

[71] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report* 33 (2007) (*Available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf) (emphasis in original).

which recently determined that global warming will have a strong impact on fisheries.[72]

The fact that many aquatic ecosystems across the country are in decline or at risk of disruption due to other stressors makes it all the more important to prevent the harms associated with impingement and entrainment.

2. Aquatic Ecosystems Do Not Carry a Fish "Surplus" Available for Destruction by Once-Through Cooling Water Systems

Fish have evolved strategies to survive natural fluctuations in environmental conditions. A primary strategy for many fish species is to produce many more offspring than are needed to maintain a stable population. This long-term production and high fecundity allow any given fish species to survive seasons in which the species is afflicted with natural stressors such as heavy predation, extreme weather, or major geological disruptions.[73] Further, there is evidence that fish species respond to population losses through increases in rates of reproduction.[74]

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[72] Food and Agricultural Organization of the United States, *Climate Change will have Strong Impact on Fisheries: Decrease in Fisheries Production Likely - FAO Holds Scientific Symposium* (July 2008) (*Available at* http://www.fao.org/newsroom/en/news/2008/1000876/index.html).

[73] Boreman, *Surplus Production, Compensation, and Impact Assessments of Power Plants*, Environmental Science & Policy 31 2000, at 445-6, *cited in* Super and Gordon, *supra* note 5, at223. *See also* National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,291-4 (Dec. 18, 2001).

[74] *Id.* at 446.

This phenomenon, referred to as "compensation," is offered by the Petitioners as support for the conclusion that killing the "surplus" fish through impingement and entrainment has only a minor impact on fish populations.[75] This conclusion ignores the fact that the reproductive strategies of fish evolved in response to variations in natural conditions and that any "surplus" in fish populations may already be needed as insurance against other stressors.[76] Fish populations are at greater risk from natural disturbances that the species might otherwise tolerate as a result of non-natural, anthropogenic impacts.[77] Adding the additional impact associated with impingement and entrainment from once-through cooling systems can only add to the risk that the impacts collectively will exceed the ability of fish populations to rebound.

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[75] Brief of Petitioners Entergy Corp, et al., *supra* note 8, at 49-50. *See also* Brief of Petitioner Utility Water Act Group, *supra* note 8, at 8-9.

[76] Boreman, *supra* note 73 at 447. ("What constitutes a surplus in reproductive effort one year may be needed the next to counteract changes in environmental conditions that affect cohort survival.").

[77] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities 66 Fed. Reg. 65,256, 65,294 (Dec. 18, 2001). "[E]ven if there is little evidence that cooling water intakes alone reduce a population's compensatory reserve, EPA is concerned that the multitude of stressors experienced by a species can potentially adversely affect its ability to recover.") *citing* J.A. Hutchings & R.A. Myers, *What can be learned from the collapse of a renewable resource? Atlantic cod, Gadus morhus, of New Foundland and Labrador*, Canadian Journal of Fisheries and Aquatic Sciences 51, 2126-2146 (1994).

In addition, as noted above in Section I.A.2, the fish and other organisms removed by cooling water intake structures are important to the ecosystem, either as food sources or predators. These indirect impacts on the ecosystem and fish populations are ignored by petitioners. Their analytical framework for determining a hypothetically available "surplus" is fundamentally flawed because it does not take account of the predator and prey relationships, or the many other interconnections, among the organisms in the impacted water body.

Dr. John Boreman of the National Marine Fisheries Service frames the issue of a "surplus" as being whether to use such "excess production" for "supporting fisheries, for allowing the population to hedge against bad times, for providing extra sustenance for natural predators, or for supporting other uses of the resource?"[78] The answer to this question becomes especially clear when considering the cumulative impacts of impingement and entrainment on fish combined with other anthropogenic harms. Fish populations and aquatic ecosystems are already at risk and may not be able to absorb additional losses. If we hope to restore aquatic ecosystems, as Congress has directed, we should not allocate natural fish population buffers to avoidable losses from impingement and entrainment in once-through cooling water systems, but should instead take all available steps to preserve that surplus as a "hedge against bad times."

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[78] *Id.*

C. There is Insufficient Information or Knowledge to Predict the Extent to Which Once-through Cooling Water Systems Impact the Ecological Integrity of Our Nation's Waters

As may be evident from the above discussion, the full scope of the impacts on aquatic ecosystems from killing vast numbers of fish, shellfish, crustaceans, plankton and other organisms cannot be accurately measured. A group of leading fisheries scientists who studied the impacts of impingement and entrainment losses from a proposed power plant noted that,

> After more than a decade of study and the expenditure of tens of millions of dollars, it was still not possible to draw definitive conclusions about the long-term effects of entrainment and impingement on fish populations in the Hudson River.[79]

These same scientists concluded from their study that,

> The ultimate question "what will be the long-term effect of once-through cooling on Hudson River fish populations?" was unanswerable.[80]

The reason the question was, and continues to be, unanswerable is that aquatic ecosystems are complex and hard to study.[81] Identifying the impacts of

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[79] Barnthouse et al., *Population Biology in the Courtroom: the Hudson River Controversy*, (1984), Bioscience, vol. 34, No. 1, at 18.

[80] *Id.*

[81] *See e.g.* Barnthouse et al., *What We Didn't Learn About the Hudson River, Why and What it Means for Environmental Assessment*, Am. Fisheries Monograph 4:329-335 (1988) at 331.

human activities on fish populations requires overcoming an array of challenging issues. These issues include consideration of factors such as the high degree of natural variability in fish populations over time, the variety of habitats that fish species may use, understanding interactions among the broad community of organisms impacted, and quantifying the sublethal, synergistic and cumulative impacts of anthropogenic harms.[82]

This conclusion, that predicting fish population responses to human-induced disturbances is an uncertain business, is not an isolated one nor does EPA dispute it. Indeed, over the course of developing the various phases of the 316(b) regulations, EPA has noted the significant uncertainties inherent in evaluating the impacts of cooling water intake structures multiple times in multiple contexts.[83]

The fish population models that petitioners have urged EPA to accept as part of a cost-benefit analysis are not sufficient to overcome the inherent uncertainty in predicting the impact of cooling water systems on aquatic ecosystems.[84] Major limitations on the use of mathematical models "include inaccurate estimates of population sizes and the inability to accurately account for marked fluctuation in reproductive success and survival of organisms from year

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[82] Rose, *Why Are Quantitative Relationships Between Environmental Quality and Fish Populations So Elusive?*, Ecological Applications 10 (2000) 367-385 (*Available at* http://www.jstor.org/stable/2641099).

[83] *Case Study Analysis*, *supra* note 33, at A26. See also *Regional Studies*, *supra* note 4, at 11-5.

[84] Newbold, et. al., *Impacts of cooling water withdrawals on fish populations at a regional scale*, 41 Environmental Science & Technology 2108, 1209 (2007).

to year."[85] Acknowledging this uncertainty in the preamble to the Phase I regulations, EPA recognized "that the limitations of existing population models, including models used to manage fisheries, may be related to our overall limited understanding of the complexity of aquatic ecosystems and the long-term effects of anthropogenic activities."[86] EPA also cited the work of a National Marine Fisheries Service advisory panel which concluded that "[u]ncertainty and indeterminancy are fundamental characteristics of the dynamics of complex adaptive systems. Predicting the behaviors of these systems cannot be done with absolute certainty, regardless of the amount of scientific effort invested."[87]

Given these uncertainties and the challenges of predicting the impacts of human activities on fisheries and aquatic ecosystems, determining the precise contribution to fisheries impacts associated with cooling water intake structures is nearly impossible. The loss of such significant numbers of organisms can cause changes that cannot be quantified such as shifts in the structure of an ecosystem and the resultant change in species diversity.[88] When considering

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[85] Kennish, *supra* note 35 at 484 *citing* Langford, *Electricity Generation and Ecology of Natural Waters* (1983).

[86] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65,256, 65,293 (Dec. 18, 2001).

[87] *Id. citing* National Marine Fisheries Service Ecosystem Principles Advisory Panel, *Ecosystem-based fishery management: A Report to Congress* 13 (1998). *Available at* www.nmfs.noaa.gov/sfa/EPAPrpt.pdf).

[88] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities 66 Fed. Reg. 65,256, 65,292 (Dec. 18, 2001). ("EPA determined that there are multiple types of undesirable and

the combination of these impacts from impingement and entrainment with the host of other impacts, it is a rational policy choice to take all available steps to minimize human impacts on aquatic ecosystems. In this case, requiring existing power plants to shift away from the use of once-through cooling water systems to other available technologies that are much less harmful is the obvious policy choice. This is the policy choice that EPA made in the context of new power plants[89] and it is the choice that Congress intended.

II. Allowing Power Plants to Damage Aquatic Ecosystems Based On a Cost-Benefit Analysis is Not Consistent with the Objective of the Clean Water Act to Restore and Maintain the Ecological Integrity of Our Nation's Waters

A. Section 316(b) Must Be Understood in the Context of the Objective of the Clean Water Act to Restore and Maintain the Ecological Integrity of the Nation's Waters

Since the full extent of harms caused by once-through cooling water systems is potentially massive and difficult to quantify, and because of the societal importance placed on the ecological health of our nation's fisheries, Congress made a logical decision to "[minimize] adverse environmental harm" through requiring the "best technology available" and not

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unacceptable adverse environmental impacts, including . . . stresses to overall communities or ecosystems as evidenced by reductions in diversity or other changes in system structure or function.").

[89] *Id.* at 65,293.

through a cost-benefit analysis. This approach is consistent with the overriding policy objective of the Clean Water Act that we not just "maintain" but "restore" the "biological, chemical and physical integrity" of our waters, an objective which reflects "a comprehensive legislative attempt 'to restore' the waters' ecological integrity." *U.S. v. Riverside Bayview Homes*, 474 U.S. 121, 132-33 (1985). The approach in Section 316(b) is also consistent with this Court's determination that the Clean Water Act should be broadly construed to protect fish habitat. *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 714, 719 (1994) (Holding that, under the Clean Water Act, a state could require minimum stream flows to protect fish habitat based on the Act's "broad conception of pollution-one which expressly evinces Congress' concern with the physical and biological integrity of water").

EPA's Phase II regulations are not, however, consistent with Section 316(b), or the goals and objectives of the Act. These regulations will result in a degree of protection no more stringent than can be proven to lead to a quantifiable benefit. Restoration of the Nation's waterways is not possible if, at the same time we are developing strategies to address a broad range of water pollution, power plants using once-through cooling systems are allowed to disrupt the aquatic ecosystems we are trying to recover. Interpreting the Clean Water Act to allow EPA to balance the multitude of complex direct and indirect impacts of once-through cooling water systems against the cost of installing available technology is inconsistent with this important objective. Given the uncertainty associated with measuring ecological harm from cooling water intake structures, authorizing EPA to go no further than it can prove is economi-

cally justifiable through a cost-benefit analysis, shifts the allocation of risk to the environment in a manner flatly inconsistent with Congress' goal to restore aquatic ecosystems.

B. Congress' Choice to Impose Stringent Technology-Based Controls on Power Plant Cooling Water Intake Structures was Necessary given their Uncertain Yet Potentially Major Impacts on Aquatic Ecosystems

The language of Section 316(b) makes clear that EPA is not allowed to balance costs against benefits when determining BTA. This point is underscored when reading Section 316(b) in context, as a provision of a law in which Congress chose to use a technology-forcing approach to addressing water pollution. Respondent Riverkeeper's brief provides a thorough analysis of the language of the statute at pages 22 through 23. This analysis suffices to answer the question presented and we will not repeat it here. It is, however, worth pondering why Congress required EPA to minimize "adverse environmental impacts" through the use of the "best technology available." 33 U.S.C. § 1326(b).

The mostly likely answer can be found by reference to the body of science, discussed above, demonstrating the complexity and magnitude of the ecological impacts from cooling water intake on water bodies. Once one understands that the harms caused to aquatic ecosystems by the large volumes of water intake resulting from once-through cooling water systems are at once both massive and extremely difficult to accurately quantify, it becomes clear that the only practical way to minimize that harm is to take all available actions to avoid it in the first place. The

potential damage to aquatic ecosystems from once-through cooling water systems was well-known at the time that the Clean Water Act was enacted. Many of the studies demonstrating the massive impacts to fisheries from cooling water intake structures were reported in the early 1970's at the same time that the debate in Congress over the Clean Water Act was taking place.[90]

In addition, technologies were available in the early 1970s and are now even more clearly available to dramatically reduce the risks of harm to fisheries from impingement and entrainment. Low-water intake systems are in use at a significant number of power plants. As noted in a recent USGS Report, "[s]ince the 1970's power plants increasingly were built with or converted to close-loop cooling systems or air-cooled systems instead of using once-through cooling system. By 2000, an alternative to once-through cooling was used in about 60 percent of the installed steam-generation capacity in the power plants."[91] Use of alternative cooling water systems is thus available to minimize environmental impacts by

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[90] U.S. Environmental Protection Agency, *In re Brunswick Steam Electric Plant*, Decision of the General Counsel, EPA GCO 41 at fn. 10 and accompanying text (June 1, 1976) (The decision notes that "[i]n the course of debating the conference report of the Act on October 4, 1972, the Senate was well aware of the dangers posed to aquatic life by the withdrawal of large volumes of water through cooling water intake structures" and cites in a footnote Senator Buckley's reference to two newspaper articles relating to the environmental impacts of cooling water systems at power plants on the Hudson River.).

[91] Hutson, *supra* note 2 at 42 *citing* Bozek, *A towering challenge*, Electrical Perspectives, January/February 2002 (*Available at* http://www.eei.org/magazine/editorial_content/nonav_stories/2002-01-01-tower.htm).

substantially avoiding both the known and unknown environmental impacts of cooling water intake structures. The selection of these cooling water systems available for minimizing adverse environmental impacts is therefore the most logical and practical choice and is the solution that Congress intended.

While Congress did not have the benefit of the past thirty-five years of intensive research to know that the true extent of the contribution of cooling water intake structures to ecological harm would remain unknown, and perhaps unknowable, Congress' choice of words makes clear that it understood this was a possibility. Rather than leave this important policy question – whether to force industry to install the best technology available regardless of the known or quantified benefit – to EPA, Congress established the standard in Section 316(b). Confronted with uncertainty, Congress chose to act and to require, not just any technology, but the "best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b).

C. The Value of the Ecological Integrity of the Nation's Waters Cannot be Quantified

Congress' decision to use a technology-forcing approach in Section 316(b) was a rational policy choice. In this case, the Court does not need, and should not be tempted, to adopt a particular economic policy in order to make a decision. The debate among proponents of various economic or social policy theories is a debate that belongs generally, and in the case of Section 316(b) actually took place, in Congress. The language of the Clean Water Act provides sufficient guidance to make it clear that EPA strayed beyond its authority when it employed cost-benefit

analysis in determining the "best technology available" for existing power plants. As noted in Respondents' brief at greater length, pages 33-43, Congress knows how to require cost-benefit analysis and did not do so in this instance. *American Textile Mfrs. Institute, Inc. v. Donovan*, 452 U.S. 490, 510 (1981).

Although the Court need not settle on any particular rationale, it is worth noting that Congress' choice of a regulatory approach in this case is supported by well-considered policy considerations. For instance, requiring the use of the "best technology available for minimizing adverse environmental impact" is consistent with a concept referred to as the precautionary principle. This approach, requiring preventive action in the face of uncertainty, is not a new one and is found not only in the Clean Water Act but in other environmental laws such as the Clean Air Act. Professor Percival notes that, "the essential notion embodied in the precautionary principle – that uncertainty should not be used as an excuse to eschew cost-effective preventive measures – is fundamental to modern environmental law's quest to transcend the limits of its common law legacy."[92] EPA itself used the language associated with this principle when adopting the Phase I regulations in 2001.[93] Use of a precautionary approach provides the

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[92] Percival, *Who's Afraid of the Precautionary Principle?* 23 Pace Envtl. L. Rev. 21, 22 (2005).

[93] National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities 66 Fed. Reg. 65,256, 65,293 (Dec. 18, 2001) ("EPA and other fishery scientist [sic] support the concept of a precautionary approach, particularly when dealing with complex systems.") *citing* Dayton, *Reversal of the burden of proof in fisheries management*. 279 Science 821-822. (1998).

best means to address the uncertainty associated with the ecological impacts of once-through cooling water systems and is the approach most consistent with objectives and goals of the Clean Water Act.

Another way to understand the rationality of Congress' choice is through the deep connection that Americans have with their rivers, lakes, estuaries and coastal waters. Commercial fisheries represent more to our nation than the dollar value of their catch but are instead part of the cultural fabric of many communities impacted by the decline in fishery ecosystems. Similarly, recreational fishing represents much more to Americans than the sum of the tourism dollars or money spent on baitfish and fishing equipment. For many American Indian communities, fisheries have deep spiritual meaning grounded in shared cultural experiences. In the words of law professor Lisa Heinzerling and economist Frank Ackerman's recent book critiquing the misapplication of cost-benefit analysis, the benefits from protecting the environment are "priceless,"[94] and "[c]ost benefit analysis of health and environmental policies trivializes" the values underlying modern environmental laws.[95] Similarly, economist Eric Davidson discusses the intangible benefits of protecting ecosystems, noting that the affected life "is a type of *natural capital* that is virtually irreplaceable and, therefore, invaluable.... [W]hen the value of a resource is unmeasurable by economists' tools, it is not *un*valuable, but rather *in*valuable."[96]

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[94] *Id.* at 8.

[95] Heinzerling, et. al., *Priceless: On Knowing the Price of Everything and the Value of Nothing* (2004) 234.

[96] Eric A. Davidson, *You Can't Eat GNP: Economics As If Ecology Mattered*, 45 (Perseus Publishing 2000).

In its cost-benefit analysis of cooling water intake structures, EPA ignores these underlying values and instead has adopted an approach which balances the known economic costs to the industry of installing alternative technologies to reduce impingement and entrainment against a calculation limited to only the known and quantifiable benefits of avoiding harm to aquatic ecosystems.[97] Although acknowledging the fact that these ecological impacts are complex and not fully known, EPA simply side-steps those complexities and makes assumptions in order to assign a numerical benefit value to the loss of fish.[98] This analysis is not only incomplete, since it ignores a wide range of non-commercial fish impacts, but also fundamentally unsound given the uncertainties.

When Congress passed the Clean Water Act, they asked EPA and states to work together to protect and restore the biological integrity of our waters as well as the chemical and physical. As noted above, this Court has understood this language as a directive to protect and restore the "ecological integrity" of the nation's waters. *Riverside Bayview Homes at* 132-33. Congress decided that we must restore the ecological integrity of our waters, not just because it is necessary to our economic well-being, but because restoring our rivers, lakes and harbors is fundamental to our nation's identity. EPA's decision to balance such

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[97] National Pollutant Discharge Elimination System Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,655-64 (July 9, 2004). Pet. App. 472a-515a.

[98] National Pollutant Discharge Elimination System—Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities 67 Fed. Reg. 17,122, 17,192-3 (April 9, 2002).

a profound goal against costs where Congress did not instruct them to do so, assumes more power than Congress has given the agency. Due to the complexity of aquatic ecosystems, and their importance to Americans, Congress made this choice for EPA and required the agency to choose the best technology it could find available. Congress has thus already considered this issue and its determination in Section 316(b) that EPA should choose the "best technology available to minimize adverse environmental impacts" should be respected.

CONCLUSION

The Court should affirm the holding of the Second Circuit that Section 316(b) does not authorize EPA to perform a cost-benefit analysis when determining the "best technology available."

Respectfully submitted,

DAVID K. MEARS *
ENVIRONMENTAL AND NATURAL
RESOURCES LAW CLINIC
VERMONT LAW SCHOOL
P.O. Box 96
South Royalton, Vermont 05068
(802) 831-1627

* Counsel of Record

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AMICUS CURIAE BRIEF

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ENTERGY CORP., PSEG LLC AND
PSEG NUCLEAR LLC, AND
UTILITY WATER ACT GROUP,

Petitioners,

v.

RIVERKEEPER, INC., *et al.*,

Respondents.

**On Writs Of Certiorari To The
United States Court Of Appeals
For The Second Circuit**

AMICUS CURIAE BRIEF OF THE STATE OF NEBRASKA, ET AL. IN SUPPORT OF THE UTILITY WATER ACT GROUP

JON BRUNING
Nebraska Attorney General
DAVID D. COOKSON
Chief Deputy
Counsel of Record
2115 State Capitol Building
Lincoln, NE 68509-8920
Tel: (402) 471-2682
Attorneys for Amici Curiae

JULY 21, 2008

COCKLE LAW BRIEF PRINTING CO (800) 225-6964
OR CALL COLLECT (402) 342-2831

22

TROY KING
Attorney General
State of Alabama
11 South Union Street
Montgomery, AL 36130
Tel: (334) 242-7300

DUSTIN MCDANIEL
Arkansas Attorney General
323 Center Street, Suite 200
Little Rock, AR 72201
Tel: (501) 682-1019

JOHN W. SUTHERS
Attorney General
State of Colorado
1525 Sherman St., Seventh Floor
Denver, Colorado 80203
Tel: (303) 866-3052

BILL MCCOLLUM
Attorney General of Florida
The Capitol, PL-01
Tallahassee, FL 32399-1050
Tel: (850) 414-3300

STEVE CARTER
Attorney General of Indiana
IGC South, Fifth Floor
302 W. Washington St.
Indianapolis, IN 46204
Tel: (317) 232-6201

STEPHEN N. SIX
Attorney General
State of Kansas
JARED S. MAAG
Deputy Solicitor General
120 Southwest Avenue, 2nd Floor
Topeka, KS 66612
Tel: (785) 296-7972

JACK CONWAY
COMMONWEALTH OF KENTUCKY
Attorney General
700 Capitol Avenue, Suite 118
Frankfort, KY 40601
Tel: (502) 696-5300

JAMES D. "BUDDY" CALDWELL
Attorney General
State of Louisiana
P.O. Box 94005
Baton Rouge, LA 70804
Tel: (225) 326-6705

MICHAEL A. COX
Michigan Attorney General
525 W. Ottawa Street
P.O. Box 30212
Lansing, MI 48909
Tel: (517) 373-1124

JEREMIAH W. (JAY) NIXON
Attorney General of Missouri
Supreme Court Building
207 West High Street
Jefferson City, MO 65101
Tel: (573) 751-3321

GARY K. KING
Attorney General of New Mexico
408 Galisteo Street
Santa Fe, NM 87501
Tel: (505) 827-6000

WAYNE STENEHJEM
Attorney General of North Dakota
600 E. Boulevard Avenue
Bismarck, ND 58505-0040
Tel: (701) 328-2210

HENRY MCMASTER
Attorney General of the
State of South Carolina
P.O. Box 11549
Columbia, SC 29211-1549
Tel: (803) 734-3970

ROBERT E. COOPER, JR.
Attorney General
State of Tennessee
425 5th Avenue
P.O. Box 20207
Nashville, TN 37202-0207
Tel: (615) 532-2586

GREG ABBOTT
Attorney General of Texas
P.O. Box 12548
Austin, TX 78711-2548
Tel: (512) 936-1700

ROBERT F. MCDONNELL
Attorney General
WILLIAM E. THRO
State Solicitor General
Office of Attorney General
900 East Main Street
Richmond, VA 23219
Tel: (804) 786-2436

RAYMOND S. FRANKS II
General Counsel
WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
601 57th Street SE
Charleston, WV 25304
Tel: (304) 926-0499, ext. 1641

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Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. Envt'l L. J. 179 (2005) 4, 5, 6

INTEREST OF AMICI CURIAE STATES

The Clean Water Act ("CWA"), 33 U.S.C. §§ 1251-1387 (1972), represents a highly successful example of cooperative federalism in the area of environmental protection. State water pollution control agencies exercise primary responsibility for implementing its provisions.[1] They are charged with carrying out ambitious and complex water pollution control programs, which the nation depends upon to protect water supplies, recreational areas, aquatic life and other uses of our water resources.

The interests of the amici curiae states are twofold. *First*, the CWA is one of several federal environmental statutes that embody a cooperative federalism structure. The Second Circuit's reasoning would erode the cooperative element of cooperative federalism and lead inexorably to the conclusion that cooperative federalism is a facade. *Second*, the amici curiae states have a strong interest in continuing their longstanding practice of holistically managing the resources within their state and considering both costs and benefits in establishing the "best technology available" as part of their permitting duties. The Second Circuit's vision of the CWA would bar states from using cost-benefit analysis to both manage

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[1] The State of New Mexico has not yet been granted primacy under the Clean Water Act by EPA. Nevertheless, it shares the interests of the other amici curiae states both as to the Clean Water Act and as to other federal environmental statutes that embody cooperative federalism.

natural resources and maximize the environmental and economic benefits from electric generating facilities in their states.

SUMMARY OF ARGUMENT

The Second Circuit's strict application of a "one size fits all" philosophy eliminates the principle of cooperative federalism between state permitting agencies and the federal government. Given the wide range of circumstances that impact whether a particular cooling system is appropriate for a given intake structure, EPA and state permitting agencies must have discretion to compare costs and benefits to determine the appropriate technology to require of an intake structure. Section 316(b)'s plain language does not prohibit cost-benefit analysis, and prior case law and other environmental statutory provisions support the conclusion that cost-benefit analysis is a critical tool for determining the "best technology available for minimizing adverse environmental impact." The evisceration of this essential principle of the CWA supports the reversal of the Second Circuit's erroneous interpretation of § 316(b).

The Second Circuit held that EPA is prohibited from comparing cost and benefits in determining the "best technology available for minimizing adverse environmental impact" from cooling water intake structures, beyond simply selecting the less expensive of two equally-effective technologies. In so holding, the Second Circuit eliminated a critical tool used

by both EPA and state permitting agencies to determine the "best technology available," a tool that considers the site-specific factors affecting a particular structure on a particular water source. Given the wide range of circumstances that impact whether a particular cooling system is appropriate for a given intake structure, EPA and state permitting agencies must have discretion to compare costs and benefits to determine the appropriate technology to require of an intake structure.

ARGUMENT

I. THE SECOND CIRCUIT'S DECISION UNDERMINES FUNDAMENTAL PRINCIPLES OF COOPERATIVE FEDERALISM.

The Second Circuit's decision should be reversed because it upsets the relationship Congress intended to engender between the federal government and the states under one of this country's most important and pervasive environmental laws: the Clean Water Act. The CWA represents a highly successful example of cooperative federalism in environmental protection. Under the CWA, state water pollution control agencies exercise the primary responsibility for implementing its provisions. They carry out ambitious and complex water pollution control programs on standard setting, permitting and enforcement, total maximum daily load (TMDL) development, watershed protection, water quality monitoring, assessment, and data management, which the nation depends upon to protect its natural resources.

A. The Role of Cooperative Federalism in American Environmental Law.

The Second Circuit's decision in this case upsets the fundamental federal-state relationship Congress established in the Clean Water Act. Congress designed the CWA as "a partnership between the States and the Federal Government" to curb and control pollution of the Nation's waters. *Arkansas v. Oklahoma*, 503 U.S. 91, 101, 112 S. Ct. 1046, 1054 (1992); *see also Save the Bay, Inc. v. EPA*, 556 F.2d 1282, 1284 (5th Cir. 1977) (explaining that the Clean Water Act "joined the Environmental Protection Agency and the fifty states in a . . . pollution battling alliance"). This Court has termed such legal regimes "program[s] of cooperative federalism." *New York v. United States*, 505 U.S. 144, 168, 112 S. Ct. 2408, 2424 (1992), (quoting *Hodel v. Virginia Surface Mining and Reclamation Assn., Inc.*, 452 U.S. 264, 289, 101 S. Ct. 2352, 2366 (1981)).[2]

"Cooperative federalism rose with the New Deal, when the national government significantly heightened its presence in the operation of state programs." Robert L. Fischman, Cooperative Federalism and Natural Resources Law, 14 N.Y.U. Envt'l L. J. 179,

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[2] Other critical environmental statutes animated by cooperative federalism principles include the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. § 136(w)(1)(a), the Safe Drinking Water Act, 42 U.S.C. § 300(g)(2)(a), the Resource Conservation and Recovery Act, 42 U.S.C. § 6947(a), and the Clean Air Act, 42 U.S.C. § 7410(k)(3).

185 (2005) ("Fischman"). Since that time, "cooperative federalism typically appears as congressional or administrative efforts to induce (but not coerce or commandeer) states to participate in a coordinated federal program." *Id.* at 184. Cooperative federalism has "emerged from its significant but transient status to become an enduring, organizing concept in environmental law[,]" which has "proven the most fertile ground for creating variations on the theme of cooperative federalism." *Id.* at 187, 188.

"Starting most notably with the environmental protection statutes passed in the 1970's, federal regulatory programs increasingly have relied on state agencies to implement federal law." Philip J. Weiser, *Federal Common Law, Cooperative Federalism, and the Enforcement of the Telecom Act*, 76 N.Y.U. L. Rev. 1692, 1695 (2001) ("Weiser"). "A critical feature of cooperative federalism statutes is the balance they strike between complete federal preemption (a preemptive federalism) and uncoordinated federal and state action in distinct regulatory spheres (a dual federalism)." *Id.* at 1697. "Rather than preempting the authority of state agencies . . . , cooperative federalism programs invite state agencies to superintend federal law." *Id.* at 1695.

As one scholar explains:

> [U]nder the foundational pollution laws, the Clean Air Act ("CAA") and the [CWA], cooperative federalism involves programs where federal monies are made available to each state contingent on its creation of a

> regulatory scheme that is at least as stringent as the federal floor. States may tailor federal standards (e.g., water quality criteria under the CWA), establish compliance strategies (e.g., state implementation plans under the CAA), implement permit programs (e.g., state pollutant discharge elimination systems under the CWA) and enforce rules (e.g., state administrative and judicial procedures.).

Fischman at 189.

There are two key elements to the brand of cooperative federalism embodied in the CWA: "(1) the fostering of state administrative programs, and (2) the delegation of tailored standard-setting." Fischman at 190. "In some cases, the cooperative federalism statute takes the form of allowing state law to operate within a federal scheme. Under the [CWA] for example, state agencies . . . are authorized to administer their own regulatory program under the mantle of federal law." Weiser at 1696 n.16, citing 33 U.S.C. § 1342.

Under the "flagship pollution control programs" like the CWA, states are allowed "to implement their own permit schemes in place of a federal permit requirement." Fischman at 191, citing 33 U.S.C. § 1342. Cooperative federalism also fosters diversity in federal regulatory programs, which Congress has seen fit to promote for at least three reasons: "(1) to allow states to tailor federal regulatory programs to local conditions; (2) to promote competition within a

federal regulatory framework; and (3) to permit experimentation with different approaches that may assist in determining the optimal regulatory strategy." Weiser at 1698.

B. The Clean Water Act Is An Exercise In Cooperative Federalism.

Under the CWA's program of cooperative federalism, state water pollution control agencies are primarily responsible for the statute's implementation. *See* 33 U.S.C. § 1251(b) (acknowledging that it is the states' "primary responsibility[y] . . . to prevent, reduce, and eliminate pollution"). Management of the nation's natural resources depends on the leading efforts of the states. Forty-six states operate permitting programs for point-source discharges into state waters through the National Pollution Discharge Elimination System ("NPDES"). *See* CWA § 402(b); 33 U.S.C. § 1342(b). Under this program, discharge of most regulated pollutants into the waters of the United States is illegal without a valid NPDES permit. States may also apply more stringent effluent limitations in their NPDES permits than those set by EPA. *See* 33 U.S.C. § 1370. States implement § 316(b) through the NPDES permitting program.

II. THE STATES CAN BEST DETERMINE HOW TO MINIMIZE ADVERSE IMPACT.

Congress gave the States the primary role in implementing the CWA for a reason – state permitting

authorities are best positioned to judge the needs of local ecosystems and the impacts of particular regulations on a state's natural resources.

A. States Must Have the Authority to Evaluate Site Specific Circumstances in Determining the Appropriate Technology to be Implemented.

EPA's Phase II Rule correctly recognized that it could not take into account the wide variety of site-specific circumstances influencing the nature or impacts of impingement mortality and entrainment in setting the national floor for cooling water intake technology. EPA, therefore, appropriately allowed the states to "tailor [§ 316(b)] . . . to local conditions" and "permit experimentation with different approaches that may assist in determining the optimal regulatory strategy." Weiser at 1698. This included the authority, in circumstances where the costs or benefits of compliance were out of alignment with EPA's national performance standards, to continue the states' long-standing practice of assessing the impact on a waterbody.

Without the opportunity to provide site-specific compliance options, states lack the authority to make informed choices in balancing resource management considerations. Taking account of local waterbody characteristics is critical for states in writing permits that prescribe the best technology available to minimize adverse environmental impacts.

For example, in some waterbodies, the major fish species that would incur impingement and entrainment mortality is invasive. In those waterbodies, the state's best means of maintaining the native aquatic organisms at that site is by writing permits that prescribe once-through cooling technologies.[3] Similarly, in states containing waterbodies with essentially minimal aquatic life, the Second Circuit's decision would require technology to protect aquatic organisms that are not present.[4]

As another example, eliminating the states' ability to make site-specific decisions could have adverse impacts on Florida's West Indian Manatee population, a federally listed endangered species. Currently, Florida has numerous steam electric power plants utilizing once-through cooling water systems. These systems take in large quantities of water for cooling purposes and therefore discharge a large quantity of warmed water to surface waters throughout Florida. While manatees are not impacted by impingement or entrainment from cooling water intake structures, they do find refuge in the warm water discharge areas of 12 Florida steam electric

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[3] 65 Fed. Reg. 29,073 n.13 (Aug. 10, 2000); 72 Fed. Reg. 37,459-69 (July 10, 2007).

[4] DCN:1-3003-BE at 308 (1974-75 impingement sampling at Big Rock Nuclear Station in Michigan produced only 326 fish weighing 49 pounds total); DCN:2-3021-BE at 207 (1974-75 impingement sampling at Ghent Electric Generation Staten recovered only six fish).

power plants during the winter season. For over 60 years manatees have come to depend on these historically consistent, warm water refuges. It is estimated that 60% of the Florida manatee population use these areas during the winter months. If these warm water areas suddenly disappear as a result of Florida's inability to consider site-specific conditions, the Florida manatee population could suffer significant losses due to their dependence on these sites and their inability to quickly adapt to alternative warm-water habitat.[5] Preserving the states' ability to account for site-specific conditions instead of requiring a "one size fits all" technology, would enable Florida to continue considering the effects on manatees in order to develop long-term solutions when determining the best technology available.

Finally, in western and drought-stricken areas, where water supplies are scarce, states must be allowed to consider technologies that ensure that the minimal water necessary is consumed.[6] Section 316(b) does not plainly require EPA and the states to ignore these and other site-specific conditions, and state permitting authorities should be afforded considerable discretion to consider them when deciding what is the "best technology available."

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[5] Fla. Dept. of Environmental Protection's Comments on EPA's Proposed Reg. for NPDES Cooling Water Intake Structures at Phase II Existing Facilities (Aug. 7, 2002).

[6] 1 *Leg. Hist.* at 263 (statement of Representative Clausen) (1973).

The Second Circuit's decision requires EPA and State permitting agencies to affirmatively ignore legitimate alternatives and will have potentially devastating effects on local and regional energy costs and reliability. State permitting authorities will be required to prescribe cooling systems at electricity generating facilities that are costly to install and that reduce the useable energy output of the plant. These two factors will substantially increase energy costs that, in many cases, will be passed on to residential, industrial, and commercial consumers. Such increases will be especially problematic due to the high costs of other available energy sources, including crude oil, heating oil, gasoline, and natural gas, which are currently at, or near, record highs. By its very terms, the Second Circuit's decision ensures that none of those costs and impacts will be justified by corresponding benefits.[7]

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[7] The only ostensible limitation set forth in the Second Circuit's decision arises when an industry cannot "reasonably bear" the cost of a particular technology. This exception suffers from the same "one-size-fits-all" flaws of the Second Circuit's rationale. In Nebraska, for example, electrical power is not produced by private industry, but rather is the responsibility of a political subdivision of the state. The citizens of Nebraska elect the boards of the local power districts and Nebraska citizens will bear the burden of the rigidity of the Second Circuit's decision.

B. States Implement a Holistic Approach to Regulation of the Power Industry.

The Second Circuit's decision also upsets the holistic approach states use to regulate the power industries within their borders.[8] In eliminating cost-benefit considerations from the analysis of the proper cooling system to implement, it is as if the Second Circuit has presumed that § 316(b) operates within a vacuum. Instead, § 316(b) is merely one piece of the extensive regulatory authority vested in states: states may also impose their own water quality standards and thermal discharge limits on power plants and may also grant variances when the situation warrants.[9] For many years the states have been evaluating these structures and managing them carefully. Stepping back from this approach now would produce serious consequences.

Implementing the lower court's decision could require state permitting authorities to write permits that will adversely affect other aspects of the environment, which states are charged with protecting. For instance, the Second Circuit's decision could

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[8] *See South Carolina v. North Carolina*, Original Action in Front of the United States Supreme Court, 2007 WL 2826231, pp. 4-5 (June 7, 2007) ("Solving . . . problems [arising out of a shortage of water] is beyond the capabilities of any one agency or group and . . . cooperative efforts between the various stakeholders in the Catawba River Basin will be necessary to protect the Basin's water resources.")

[9] NPPD Variance cited in MO River Brief.

require states with ozone pollution problems, but healthy waterbodies, to mandate closed-cycle cooling because the ozone precursor-impingement mortality tradeoff was not sufficiently great on a national level to allow EPA to provide for once-through cooling. The resulting increase in production by the facility, to compensate for the power penalty imposed by closed-cycle cooling would exacerbate the ozone precursor problem while the environmental benefits to the already-healthy waterbody would be nominal.

Mandating closed-cycle cooling will also have substantial negative impacts on residents and businesses of the Amicus States. EPA determined in the Phase II Rule that requiring existing power plants to retrofit would cost $2.26 billion and close nine power plants. At a time when power supplies are under stress nationwide and electric producers are faced with a host of new requirements under the Clean Air Act and CWA, requiring EPA and State permitting agencies to ignore the cost of regulations in comparison to the benefits will force the industry to make adjustments in production. The resulting adjustment will inevitably have dire consequences for the public in both the amount of electricity generated and the costs to acquire that electricity.

Amicus States are not seeking that all states be *required* to initiate a cost-benefit analysis whenever environmental requirements are considered, including under § 316(b). However, states should not be *forbidden* from considering costs and benefits when such a tool could help reach better decisions. The

diverse interests and conditions present in the amici curiae states provide an accurate portrait of the importance of the flexibility provided by EPA's interpretation of § 316(b).

As a practical matter, the Second Circuit's decision will force the states to impose the most stringent intake structure requirements that can be technically accomplished. As a result, states are prohibited from taking into account local waterbody characteristics in determining what technology is the "best," and are similarly prohibited from considering costs and benefits. Such a stripping of the states' ability to consider the costs and benefits in determining the appropriate cooling system to be implemented at a site-specific location, and upholding a ruling which would require most power plants to convert to a closed-cycle cooling system, would upset the careful regulatory balance implemented by the states.

CONCLUSION

The Second Circuit erred in ruling that EPA and the states were prohibited from considering costs and benefits to determine the "best technology available for minimizing adverse environmental impact" from cooling water intake structures. The Second Circuit's decision impairs the CWA's cooperative federalism by disempowering states from requiring the technology that best suits the needs of the particular site in question. Additionally, without the ability to use a

cost benefit analysis, the increased costs and other consequences associated with installing new cooling water intake systems will not be justified by any determination of corresponding benefits to the ecosystem and species affected. For the foregoing reasons, the amici curiae states respectfully request that this Court uphold EPA's consideration of costs and benefits as appropriate under § 316(b) and reverse the ruling of the Second Circuit.

Respectfully submitted,

JON BRUNING
Nebraska Attorney General
DAVID D. COOKSON
Chief Deputy
Counsel of Record
2115 State Capitol Building
Lincoln, NE 68509-8920
Tel: (402) 471-2682
Attorneys for Amici Curiae

AMICUS CURIAE BRIEF

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v.

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PSEG FOSSIL LLC AND PSEG NUCLEAR LLC

v.

RIVERKEEPER, INC., *et al.*

UTILITY WATER ACT GROUP

v.

RIVERKEEPER, INC., *et al.*

ON WRITS OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

BRIEF FOR THE NUCLEAR ENERGY INSTITUTE AS AMICUS CURIAE SUPPORTING PETITIONERS

ELLEN C. GINSBERG
MICHAEL A. BAUSER
NUCLEAR ENERGY INSTITUTE
1776 I Street, N.W.
Washington, D.C. 20006
(202) 739-8000

SETH P. WAXMAN
Counsel of Record
EDWARD C. DUMONT
BRIAN M. BOYNTON
WILMER CUTLER PICKERING HALE AND DORR LLP
1875 Pennsylvania Ave., N.W.
Washington, D.C. 20006
(202) 663-6000

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INTEREST OF AMICUS CURIAE

The Nuclear Energy Institute (NEI) represents the commercial nuclear energy industry on regulatory matters.[1] NEI's members include every entity licensed by the Nuclear Regulatory Commission (NRC) to generate electricity at a commercial nuclear power plant in the United States. Members also include nuclear plant designers, major architecture and engineering firms, fuel fabrication facilities, and other organizations and individuals involved in the nuclear energy industry.

This Court's interpretation of Section 316(b) of the Clean Water Act (CWA) in these cases could significantly affect most, if not all, of the 38 U.S. nuclear power plants that do not currently use "closed-cycle" cooling water systems. NEI can offer the Court an informed perspective on the statutory issue presented and on the likely practical consequences of an incorrect interpretation of Section 316(b).

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[1] No counsel for a party authored this brief in whole or in part, and no party or its counsel made a monetary contribution intended to fund the preparation or submission of this brief. Petitioners PSEG Nuclear LLC and Entergy Corporation, and certain members of petitioner Utility Water Act Group with nuclear plants, are members of NEI and make contributions that support all of NEI's activities, including the filing of amicus briefs. No person other than NEI, its members, or its counsel made a monetary contribution to the preparation or submission of this brief. Letters from all parties either consenting generally to the filing of amicus curiae briefs in these cases or consenting specifically to the filing of this brief have been filed with the Court.

INTRODUCTION AND SUMMARY OF ARGUMENT

Nuclear power facilities are an integral part of our nation's energy production infrastructure. Nuclear plants supply one-fifth of the country's electricity, and the reliability of nuclear power makes it critical to the functioning of the electrical grid. Moreover, the low variability of nuclear power prices and supply has a stabilizing effect on the market for electricity generally. Of particular importance in light of concerns about global climate change, nuclear power plants emit no greenhouse gases.

Refusing to defer to the longstanding interpretation by the Environmental Protection Agency (EPA) of its statutory authority, the court of appeals read Section 316(b) of the Clean Water Act to foreclose the agency from comparing costs to benefits in determining what is, under particular circumstances, "the best technology available for minimizing [the] adverse environmental impact" caused by cooling water intake structures at existing large power plants. 33 U.S.C. § 1326(b). The court would have permitted the EPA to consider the cost of implementing a particular technology in only very limited respects—principally, to determine whether it could "reasonably [be] borne" by the industry as a whole. Pet. App. 24a-26a.[2]

At a minimum, Section 316(b) permits the EPA to consider any adverse impact that adoption of a particular technology would have on the environment gener-

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[2] Citations to "Pet. App." refer to the Appendix to the Petition for a Writ of Certiorari filed by Entergy Corporation in No. 07-588.

ally and on the nation's energy supply. By its terms, the provision calls for the EPA to require adoption of the "best" technology available (BTA) to minimize "adverse environmental impact[s]" across the board. This language readily permits consideration of energy supply impacts and environmental impacts beyond just those involving impingement or entrainment of aquatic life at the intake location.

In the case of nuclear power, this means that the EPA must be permitted to consider the costs of implementing particular technologies at individual plants in order to assess how requiring those technologies would itself affect both the energy supply and the environment, including by potentially forcing plant closures. Nuclear power plays a particularly important role in maintaining the nation's baseload power supply and is a key technology for combating global climate change. If existing nuclear plants are forced to close, either temporarily or permanently, in the near and medium term, their power output could realistically be replaced, if at all, only by plants that burn fossil fuels.

Mandating the adoption of closed-cycle cooling by existing plants likely would lead to the closure of some nuclear plants. Retrofitting existing nuclear plants to use closed-cycle cooling would be exceedingly expensive, if feasible at all, and would entail its own environmental costs. Individual nuclear plant owners have estimated that retrofitting closed-cycle cooling systems at particular plants could cost $ 1 billion or more. For some plants, the high cost of retrofitting closed-cycle cooling could make shutting down the only economically feasible option. In order adequately to consider the impacts on the environment and the supply of energy of selecting closed-cycle cooling as BTA, the EPA necessarily must be permitted to consider both the environ-

mental and fiscal costs of implementing that technology.

Because the adverse environmental and energy supply impacts of closing individual nuclear plants are so significant, it is also important that the EPA have the discretion to weigh these costs against the benefits that might be obtained from adopting a particular technology at a *specific site*. The court of appeals foreclosed any case-by-case or site-by-site cost/benefit analysis. This Court should reject any such limitation on the EPA's implementation of Section 316(b).

ARGUMENT

I. NUCLEAR PLANTS PROVIDE CRITICAL BASELOAD POWER WITH IMPORTANT ENVIRONMENTAL ADVANTAGES

The supply of power in the United States is under strain. In some regions, supply at times barely meets demand. During the summer of 2006, for example, a heat wave "required utility system operators, customers, and government agencies to implement emergency procedures in some areas." North American Electric Reliability Corporation (NERC), *2006 Long Term Reliability Assessment: The Reliability of Bulk Power Systems in North America* 5 (Oct. 2006), *available at* http://www.nerc.com/~filez/rasreports.html.[3] Blackouts

[3] NERC is the entity certified by the Federal Energy Regulatory Commission as the single "Electric Reliability Organization" for the United States under Section 215 of the Federal Power Act, 16 U.S.C. § 824o(c). *See* FERC, *Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing*, 116 FERC ¶ 61,062 (July 20, 2006).

were avoided principally "because generating capacity performed extremely well during this period." *Id.*

The problem is likely to get worse before it gets better. Over the next ten years, the utility industry expects peak demand to increase by over 17%, while committed generating capacity is expected to increase by only 8.4%. NERC, *2007 Long Term Reliability Assessment: The Reliability of Bulk Power Systems in North America* 10 (Oct. 2007) (2007 NERC Assessment), *available at* http://www.nerc.com/~filez/rasreports.html. In a number of regions, capacity margins are expected to drop well below target levels. *Id.* at 24.

Against this backdrop, nuclear power plants are an exceedingly important source of power. There are currently 104 operating units at more than 60 nuclear plant sites in the United States. These plants generate approximately 20% of the nation's electricity.[4] Along with coal and natural gas, nuclear energy is a foundational part of the nation's power supply.

Nuclear power is a particularly important source of generation because of its cost stability and output reliability. The supply and cost of nuclear power do not fluctuate significantly based on weather or climate conditions, fuel costs, or the availability of imported supplies. Nuclear plants are able to operate without interruption for extended periods—up to 24 months at a time. As a result, nuclear power is an important component of the "baseload" electrical power generation

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[4] *See* Comments of the Nuclear Energy Institute, Comment ID 316bEFR.020.002, at 407. The comments cited in this brief are available in http://www.epa.gov/waterscience/316b/phase2/comments/author-ph2.pdf. The page citations provided are to this compilation of the comments arranged by author.

that is necessary for the national electric power grid to function. Indeed, the stability of the grid depends on nuclear power.

Nuclear energy is also comparatively inexpensive. Nuclear plants are currently estimated to be the lowest-cost producers of baseload electricity.[5] The consistent availability of nuclear power at predictable prices also has a stabilizing effect on the electricity market as a whole.

Nuclear power also has important environmental advantages over other forms of energy production. As this Court has recognized, the world faces serious threats from global climate change. *See Massachusetts v. EPA*, 127 S. Ct. 1438, 1455-1456 (2007). The United Nations Intergovernmental Panel on Climate Change (IPCC), which in 2007 shared the Nobel Peace Prize for its work on global warming, has concluded that "[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level."[6] "Average Northern Hemisphere temperatures during the second half of the 20th century were *very likely* higher than during any other 50-year period in

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[5] *See U.S. Nuclear Power Plants Set Record Highs For Electricity Production, Efficiency in 2007* (Feb. 6, 2008), *available at* http://www.nei.org/newsandevents/newsreleases/setrecordhighs/.

[6] *Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report* 2 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

the last 500 years and *likely* the highest in at least the past 1300 years."[7]

Many believe that climate change is caused in significant part by the emission of greenhouse gases, including carbon dioxide.[8] It has been estimated that in 2004 about one-quarter of global greenhouse gas emissions were from energy production.[9] Nuclear power plants, however, emit no greenhouse gases. Nuclear plants—not other alternative sources—generate more than 70% of all carbon-free electricity in America.[10] By contrast, hydropower and solar, wind, and geothermal sources together account for less than 30%. Increased electricity production by nuclear power plants was responsible for over one-third of all voluntary greenhouse gas reductions reported by the electric power sector in 2005. It is estimated that using nuclear power instead of fossil-fuel-burning power plants prevented 681 million metric tons of carbon dioxide emissions in 2006. The volume of greenhouse gas emissions avoided by the use of nuclear power in the United States is equivalent to taking more than 95% of all passenger cars off the

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[7] *Id.*

[8] *Id.* at 5 ("Most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic [greenhouse gas] concentrations.").

[9] *Id.*

[10] The factual points in the remainder of this paragraph are drawn from a more detailed discussion, *Nuclear Energy Plays Essential Role in Reducing Greenhouse Gas Emissions*, available on NEI's website at http://www.nei.org/resourcesandstats/documentlibrary/protectingtheenvironment/policybrief/nuclearenergyreducinggreenhousegasemissions/.

nation's roadways. Globally, the use of nuclear energy prevents the emission of more than 2.6 billion metric tons of carbon dioxide each year.[11]

For these reasons, the United Nations IPCC in its Fourth Assessment Report listed "nuclear power" as a "key" technology for mitigating greenhouse gas emissions—a technology, importantly, that is "currently commercially available."[12] It has also concluded that "[n]uclear power is . . . an effective [greenhouse gas] mitigation option."[13]

II. SECTION 316(b) PERMITS THE EPA TO CONSIDER THE EFFECT OF IMPLEMENTATION COSTS ON INDIVIDUAL PLANTS IN DETERMINING BTA

Section 316(b) of the Clean Water Act directs the EPA to "require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). As explained by petitioners and the government, this provision permits the EPA to conduct cost-benefit analysis

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[11] Even when greenhouse gas emissions are analyzed for the entire life cycle of a nuclear power plant—from uranium mining to electricity production to used fuel management—nuclear energy is comparable to solar, wind, and hydropower sources.

[12] *Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report* 17.

[13] *Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* 269 (Cambridge Univ. Press 2007), *available at* http://www.mnp.nl/ipcc/pages_media/AR4-chapters.html; *see also id.* ("Total life-cycle [greenhouse gas] emissions per unit of electricity produced from nuclear power are . . . similar to those for renewable energy sources.").

in determining BTA. The language, structure, and legislative history of Section 316(b) unambiguously authorize such an analysis. *See* Br. for Petitioners Entergy Corp., PSEG Fossil LLC, and PSEG Nuclear LLC 31-52.[14] Moreover, as explained in detail below, at a minimum, Section 316(b) allows the EPA to consider the environmental and energy costs of retrofitting a proposed technology, including those that would result if the high cost of retrofitting led to nuclear plant closures.

A. Section 316(b) Permits Consideration Of All Adverse Environmental Impacts, Not Just Effects On Aquatic Life, And Of Effects On Energy Supply

1. Section 316(b) instructs the EPA to determine "the best technology available for minimizing *adverse environmental impact*." 33 U.S.C. § 1326(b) (emphasis added). The term "adverse environmental impact" is not separately defined. Its plain meaning is not limited to impacts on aquatic life. Rather, the term encompasses the whole range of potential adverse environmental impacts related to the adoption of a particular technology.

Section 316(b)'s reference to Sections 301 and 306 of the CWA reinforces this conclusion. The provisions relied upon by the court of appeals, which address the "best available technology" (BAT) and "best available demonstrated control technology" (BADT) standards,

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[14] Even if the provision were deemed not to unambiguously permit cost-benefit analysis, it surely does not unambiguously foreclose such an analysis. *See* Br. of Petitioner Utility Water Act Group 31-37; Br. for the Federal Parties as Respondents Supporting Petitioners 15-26.

expressly permit the EPA to consider "non-water quality environmental impact" in determining the relevant effluent reduction technologies. *See* 33 U.S.C. §§ 1311(b)(2)(A) (referencing § 1314(b)(2)), 1314(b)(2)(B), 1316(B)(1)(b).

The EPA's interpretation of "adverse environmental impact" is consistent with its plain meaning. In the rulemaking at issue here, the EPA concluded that, although it was focusing primarily on impingement and entrainment of aquatic life, it could consider air quality impacts in setting BTA:

> [T]he net effect [of the energy penalty] would be more consumption of fossil fuel, which in turn increases the emission of sulfur dioxide, NO_x, particulate matter, mercury, and carbon dioxide. Increasing fuel consumption at existing coal power plants yields the largest increase in air emissions because existing systems are less efficient at producing power (and therefore burn more coal) and because they generally have less air pollution control equipment in place. *EPA believes that it is reasonable to consider these non-water quality environmental impacts* . . . in making today's decision.

National Pollutant Discharge Elimination System—Final Regulations To Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,605 (July 9, 2004) (Phase II Rulemaking) (emphasis added). This interpretation of the Act extends to other non-water quality impacts, and it is entitled to deference, *see Chevron U.S.A. Inc.* v. *Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-843 (1984).

The court of appeals itself recognized that, at least in some circumstances, "the EPA could rely on factors other than impingement and entrainment in establishing BTA, such as negative environmental impacts." Pet. App. 37a; *see also id.* at 26a n.12 (permitting consideration of "energy efficiency or environmental impact").[15] But as explained below, in order to consider other adverse environmental impacts, the EPA must consider the costs of implementing different technologies—an inquiry the court of appeals seemingly has forbidden except in very narrow circumstances. Thus, although the court of appeals correctly interpreted Section 316(b) to permit the EPA to undertake a broad inquiry into potential adverse environmental effects, its insistence that the agency forego cost-benefit analysis threatens to preclude that very inquiry.

2. Section 316(b) also permits the EPA to consider the impact that selection of a particular technology would have on the nation's supply of energy. The provision does not directly address effects on energy supply, but its mandate that the EPA select the "best" technology for "minimizing adverse environmental impact" readily permits consideration of energy supply impacts. Considerations of energy supply are inherently linked to considerations of environmental impact, since most means of generating energy—and certainly those that can replace short-term energy shortfalls—affect the environment. Moreover, given the extreme

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[15] Likewise, in *Riverkeeper, Inc.* v. *EPA*, 358 F.3d 174 (2d Cir. 2004) (*Riverkeeper I*), the court held that "the Clean Water Act allows the EPA to make a choice among alternatives based on more than impingement and entrainment," *id.* at 196, and affirmed the EPA's consideration of, among other things, "undesirable air emissions," *id.* at 194-195.

importance of maintaining an adequate, stable supply of electricity, the effect of a given technology on the nation's electricity supply is an important consideration when determining the "best" technology.

This conclusion is further buttressed by Sections 301 and 306 of the Act. Although the provisions governing BAT and BADT do not expressly address cost/benefit weighing, they do expressly permit the EPA to consider "energy requirements" in adopting effluent reduction technologies. *See* 33 U.S.C. §§ 1314(b)(2)(B), 1316(B)(1)(b).

The EPA has interpreted Section 316(b) to permit consideration of impacts on energy supply in selecting the BTA for existing plants. In rejecting mandatory retrofitting of closed-cycle cooling, the EPA stated:

> Another issue concerns the energy impacts of cooling towers. EPA examined the information it received after publication of the proposed rule and [Notice of Data Availability], and agrees that the energy penalty associated with cooling towers, together with other factors, indicates that this technology is not the best technology available *for existing facilities* for minimizing adverse environmental impacts associated with cooling water intake structures.

69 Fed. Reg. at 41,605 (emphasis added); *compare National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities*, Final Rule, 66 Fed. Reg. 65,256, 65,259-65,260 (Dec. 18, 2001) (requiring closed-cycle cooling or its equivalent at new facilities). Again, this interpretation is subject to deference under *Chevron*.

The court of appeals acknowledged that Section 316(b) permits consideration, at least in some circumstances, of impacts on energy supply. Pet. App. 37a.[16] But, as illustrated below, the court of appeals' limitation on the EPA's ability to consider the costs of implementing different cooling water intake structure technologies calls into question the agency's ability adequately to consider energy supply impacts.

B. Adverse Environmental And Energy Supply Impacts Could Result From Nuclear Plant Closures Caused By The High Cost Of Retrofitting Closed-Cycle Cooling As Well As The Retrofitting Itself

As NEI noted in its brief in support of certiorari, retrofitting existing nuclear plants to use closed-cycle cooling is at best a complicated, costly, and time-consuming process, which might not be economically feasible at some plants.[17] Mandating the use of closed-

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[16] *See also id.* at 26a n.12 ("[T]he Agency may also depart from this performance benchmark because of other permissible considerations aside from cost, for instance, energy efficiency . . . ."); *Riverkeeper I*, 358 F.3d at 194-196 (upholding selection of BTA in part based on consideration of energy efficiency).

[17] If the EPA is foreclosed from considering the costs of implementing proposed technologies except in the limited respects permitted by the court of appeals, respondents will almost certainly contend that the agency must mandate adoption of closed-cycle cooling. The EPA has already determined that retrofitting plants to use closed-cycle cooling generally will reduce impingement and entrainment to a greater degree than upgrading the design and construction of water intake structures at once-through plants. *See* 69 Fed Reg. at 41,606. While the reductions achievable using other technologies "approach[]" those from closed-cycle cooling, respondents will surely argue that they are not "essentially the same" in the only sense that the court of appeals would recognize as allowing selection of the lower-cost alternative. *See* Pet.

cycle cooling at all existing nuclear plants would have its own environmental costs—due in part to decreased plant efficiency and extended plant closures—and could further decrease the nation's supply of energy and harm the environment by forcing some nuclear plants to shut down permanently.

1. Retrofitting large existing plants to use closed-cycle cooling would pose significant fiscal and engineering challenges. Among other things, closed-cycle cooling requires an extensive network of pipes to circulate water to and from the plant's condensers. For example, it is estimated that retrofitting the Salem Generating Station to use closed-cycle cooling would require the demolition or abandonment of over three miles of existing 7-foot and 10-foot diameter circulating water pipe and the installation of over 4 miles of new 7-foot pipe. *See, e.g.*, Comments of UWAG, Comment ID 316bEFR.041.351, at 1330. Additionally, many plants would need to reinforce their condensers to withstand the increased pressure resulting from closed-cycle cooling and otherwise modify them for use with the retrofitted system.

In addition, in order to make the changes necessary to convert to closed-cycle cooling, plants would need to shut down for what could be prolonged periods of time. The EPA estimated that plants would be unavailable for as long as 10 months. *See* 69 Fed. Reg. at 41,605. Private estimates suggest that retrofitting the Diablo

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App. 26a, 28a, 34a n.16, 36a. If that is correct, the court of appeals' decision, if affirmed, would require the EPA to mandate retrofitting of all existing plants to use closed-cycle cooling, so long as the billions of dollars that retrofitting would cost could theoretically be borne by the industry as a whole.

Canyon and San Onofre nuclear power plants would render them unavailable for 12 months or more, that the Indian Point nuclear power plant would be closed for approximately 10 months, and that the Oyster Creek nuclear power plant would have to be shut down for more than four months. Extended outages would also be anticipated at the Salem nuclear power plant. *See* PSEG Pet. 34 (estimating that a closed-cycle retrofit "would require partially suspending operations for at least 14 months, causing a net loss of 1150 megawatts . . . during that period"). Shutdowns of this sort impose substantial costs on plant owners.

Even once returned to operation, retrofitted plants would inevitably produce less usable power than they did before they were converted to use closed-cycle cooling. A steam power plant's condenser "operates under vacuum conditions (i.e. a pressure below normal atmospheric pressure)." Comments of Department of Energy, Comment ID 316bEFR.010.101, at 239. Because cooling water in once-through systems has on average a lower temperature than water in closed-cycle cooling systems, the vacuum created in once-through systems is greater than in closed-cycle systems, which increases efficiency. *Id.* In addition, plants using closed-cycle cooling require more power to run the cooling system itself, leaving less for consumers.

In its Phase II Rulemaking, the EPA relied on an estimate by the Department of Energy (DOE) that the "energy penalty" resulting from converting existing once-through plants to closed-cycle cooling would generally amount to a 2.4% to 4.0% decline in energy production capacity. 69 Fed. Reg. at 41,605. The EPA noted a 5.3% energy penalty associated with the use of closed-cycle cooling for one nuclear plant that provides 78% of the electricity for Vermont. *See id.* Using the

same DOE figures relied upon by the EPA, it has been estimated that retrofitting all existing nuclear plants to use closed-cycle cooling would reduce overall capacity by 2,117 megawatts. As the EPA explained with respect to both nuclear and non-nuclear plants, "on average 20 additional 400-MW plants might have to be built to replace the generating capacity lost by replacing once-through cooling systems with wet cooling towers if such towers were required by all Phase II facilities." *Id.* The energy penalty imposed by closed-cycle cooling is yet another cost that would have to be borne if plants were required to retrofit closed-cycle cooling.

Additionally, in order to retrofit closed-cycle cooling, some plants would need to acquire land on which water cooling towers could be built. In rejecting mandatory closed-cycle retrofits, the EPA noted that "31 out of 56 plants surveyed said that they would need to acquire additional property to accommodate cooling towers." 69 Fed. Reg. at 41,605. For some plants, finding and using land for cooling towers would present daunting challenges—both fiscal and environmental. For example, retrofitting the Diablo Canyon plant on the central California coast, if it could be done at all, would require excavating a 1600-foot by 600-foot section of the Las Cañadas coastal hills adjacent to the plant to make room for the construction of 132 60-foot-tall water tower cells.[18] Retrofitting the San Onofre plant, on the coast between San Diego and Los Angeles, likely would require construction of cooling water tanks at the top of 100-foot bluffs overlooking the beach adjacent to the plant. Acquiring or developing land for

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[18] Unless otherwise indicated, examples in this brief are drawn from information provided by plant operators.

water cooling towers thus could impose significant costs.

Finally, some existing plant owners likely would need to acquire federal, state, and possibly local permits to proceed with retrofitting. Some retrofits, for instance, would require a license amendment from the NRC, which requires a formal approval process generally involving public hearings. *See* 10 C.F.R. § 50.91.[19] Obtaining such amendments would consume substantial NRC and private resources. Efforts to obtain the permits necessary to address what the court of appeals viewed as the fish-protection requirements of the Clean Water Act could well be hampered by adverse environmental impacts of other sorts that might result from retrofitting plants to use closed-cycle cooling. For example, salt-water cooling towers produce large plumes of salt water vapor that can contribute to salt contamination, fogging, and icing in the surrounding area and affect nearby electrical equipment. It is also anticipated that mandating construction of cooling towers would generate concern about increased noise. The prospect of extensive construction in sensitive areas, such as around the coastal Diablo Canyon and San Onofre plants, would raise substantial additional concerns that could delay or even preclude obtaining necessary approvals. As the EPA noted, expanding some plants might require displacement of ecologically valuable lands. 69 Fed. Reg. at 41,605. The San Onofre plant,

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[19] A license amendment is required if a proposed change to a nuclear plant involves, among other things, a modification to technical specifications. *See id.* § 50.59(c)(1)(i). Whether retrofitting to use closed-cycle cooling would require a license amendment would be a plant-specific determination.

for example, is surrounded by federal and state lands that support species protected by state and federal laws.

In addition to possible adverse effects on the land and air surrounding plants, retrofitting could adversely affect the very water resources protected by the Clean Water Act. Although a closed-cycle cooling system at a nuclear plant does not take in as much water from the natural source day-to-day as a once-through system, it actually *consumes* (that is, permanently removes from the source water body) up to 80% *more* water overall. *See Water & Sustainability (Volume 3): U.S. Water Consumption for Power Production—The Next Half Century* viii (Elec. Power Research Inst. 2002). Moreover, efforts to obtain permits for retrofits—despite these environmental impacts—would occur at a time when the NRC and industry are concentrating on applications to renew operating licenses at existing nuclear plants and on licensing and constructing new plants that are necessary to meet the expanding demand for power.

In the face of these substantial potential obstacles, the EPA recognized that, in some instances, retrofitting nuclear plants to use closed-cycle cooling would be prohibitively expensive:

> [A] national requirement to retrofit existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable. EPA estimates that the total capital costs for individual high-flow plants (i.e., greater than 2 billion gallons per day) to convert to wet towers generally ranged from $130 to $200 million,

> with annual operating costs in the range of $4 to $20 million . . . .

69 Fed. Reg. at 41,605.

Moreover, the EPA acknowledged that, for a variety of reasons, even its substantial cost estimates might "not fully reflect the costs of the option." 69 Fed. Reg. at 41,605. Indeed, forecasts by individual plant operators run higher than the EPA's estimates. The Edison Electric Institute, the association of U.S. shareholder-owned electric companies, has estimated that retrofitting the 38 existing nuclear plants that do not use closed-cycle cooling would cost between $10 billion and $19 billion.[20] Estimates of the cost of retrofitting all existing once-through plants with closed-cycle cooling submitted to the EPA by petitioner Utility Water Act Group ranged from $40 to $66 billion. *See* UWAG Pet. 37. Using the high end of the EEI range, the average cost per nuclear plant would be $500 million. For each of four plants—Diablo Canyon, Salem Generating Station, San Onofre, and Indian Point—EEI or plant owners estimate that the cost of retrofitting could total $1 billion or more. At Diablo Canyon alone, retrofitting could cost in the range of $2.4 billion.

In light of the significant cost of retrofitting closed-cycle cooling, if the EPA mandates such retrofitting at all existing nuclear power plants, some of those plants could well find it economically impossible to continue operation.

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[20] This range is derived from cost estimates submitted to the EPA adjusted with some site-specific cost estimates provided by individual operators.

2. Any closures of nuclear plants due to the high cost of retrofitting closed-cycle cooling would have adverse effects on the nation's energy supply and on the environment.

First, the loss of generating capacity from nuclear plants that are forced to close would have a significant adverse impact on the nation's overall supply of power. While the lost capacity might eventually be replaced, in the short term, air quality limitations would likely prevent fossil-fuel plants from attempting to meet the entire shortfall, and existing nuclear plants lack additional capacity. In areas of the country already facing energy constraints, such as California and the mid-Atlantic/Northeast corridor, the near-term reduction in capacity would increase the likelihood of brownouts and blackouts during the summer months. Thus, in its comments to the EPA, petitioner Entergy estimated that if its Indian Point nuclear plant were to close, target reserve margins in New York could not be met and "the calculated number of days where emergency measures would be taken to prevent blackouts, etc., would rise by 800%." Comments of Goodwin Procter (submitted on behalf of Entergy Corp.), Comment ID 316bEFR.029.035, at 619.[21]

NERC has recognized that mandating closed-cycle cooling could adversely affect the nation's power capacity margins In its 2007 reliability report, NERC explained:

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[21] Even temporary plant closures to allow retrofitting would have a significant impact. Because of their length, the anticipated closures would likely overlap with the winter or summer peak electricity demand seasons, threatening the reliability of the power grid.

> While plant specific outcomes will vary, retrofitting existing power plants with cooling towers can reduce the capacity of those plants, which will exacerbate the supply concerns identified in ... this assessment. In some cases, retrofits may prove so costly that plants are retired earlier than projected, with the consequent loss of the plant's entire capacity. At a time when additional electricity generating resources are needed, the loss of existing generating capacity would undermine U.S. efforts to meet the growing demand for electricity.

2007 NERC Assessment 12.[22] For this reason, during the Phase II Rulemaking the DOE "strongly" recommended that the EPA not require all existing plants to be retrofitted to use closed-cycle cooling. Comments of Department of Energy, Comment ID 316bEFR.010.028, at 185.

Second, the closure of nuclear plants required to retrofit closed-cycle cooling would have significant adverse environmental effects. Over the short and medium term, new nuclear plants cannot realistically replace power lost due to closures of nuclear plants. Designing a new nuclear plant, obtaining necessary permits, and building the plant takes years. New nuclear projects already in early stages of development are not expected to begin production until 2015 to 2020. Thus, as a practical matter, for at least several years, generating capacity lost from existing nuclear plants would

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[22] *See also id.* at 97 ("Besides the de-rating of existing units, the costs of retro-fitting cooling towers for many older plants may be prohibitive and some may be retired potentially jeopardizing resource adequacy in many regions of the U.S.").

have to be replaced—to the extent it can be replaced at all given constraints on existing plants—largely by power generated using fossil fuels.

The EPA understood that requiring retrofitting would result in increased reliance on fossil fuels. *See, e.g.*, 69 Fed. Reg. at 41,605. That, in turn, would increase "the emission of sulfur dioxide, NO_x, particulate matter, mercury and carbon dioxide." *Id.* It is estimated that using fossil fuels to replace the nuclear power lost due to the retrofitting energy penalty alone could add 37,000 tons of sulfur dioxide, 13,000 tons of nitrogen oxide, and 14 million metric tons of carbon dioxide to the nation's atmosphere annually.[23] To the extent power from fossil-fuel plants also replaces capacity lost as a result of nuclear plant closures, the increase in greenhouse gas emissions would be even more severe.

III. The EPA Is Permitted To Weigh Costs Against Benefits On A Case-By-Case And Site-By-Site Basis

Because of the substantial negative effects that closing nuclear plants would have on the environment and the nation's energy supply, it is important that the EPA be permitted not only to weigh costs against benefits generally but also to do so on a case-by-case and site-by-site basis. "EPA and State permitting authorities have been implementing CWA section 316(b) on a case by case basis for over 25 years." 69 Fed. Reg. at 41,626. The Phase II rules continue this practice in part by permitting a facility to obtain a site-specific assessment of BTA by demonstrating "that its costs would be significantly greater than the benefits of com-

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[23] Carbon dioxide typically is measured in metric tons, which are equivalent to approximately 2205 lbs.

plying with such performance standards at the facility." *Id.* at 41,603; *see also* 40 C.F.R. § 125.94(a)(5).

The court of appeals rejected the agency's site-specific cost-benefit provision primarily for two reasons: (1) because it concluded that any cost-benefit comparison was improper, and (2) because the provision supposedly "impermissibly authorizes the EPA to consider the degraded quality of waterways in selecting a site-specific BTA." Pet. App. 58a. This Court should make clear that, to the contrary, the EPA may weigh costs against benefits on a case-by-case basis.

The text of Section 316(b) provides no indication that the agency was acting contrary to its authority for almost 30 years when it made determinations of BTA solely on a case-by-case basis. At most, Section 316(b) is silent as to whether the EPA should promulgate uniform national standards or make case-by-case determinations. In fact, the provision's instruction that the EPA determine the optimal "location" of cooling water intake structures—which is almost certain to vary from place to place—supports the EPA's position that case-by-case and site-by-site determinations of BTA are permitted.

The court of appeals believed that case-by-case determinations of BTA are not permitted because in 1972 Congress "changed its approach" to regulating *effluents* under the CWA. The court noted that the provisions of the CWA addressing effluents "now regulate[] discharges from point sources rather than water quality." Pet. App. 58a. But that observation is beside the point. In contrast to the effluent reduction provisions, Section 316(b) requires the EPA to mandate use of the best technology available to minimize "*adverse envi-*

ronmental impact." 33 U.S.C. § 1326(b) (emphasis added).[24]

Foreclosing the EPA from considering the amount and nature of aquatic life in the water bodies from which cooling water is drawn makes no sense under Section 316(b). As the EPA explained, "because of the location of the intake, the characteristics of a particular waterbody, or the behavioral patterns of the fish or shellfish in that particular waterbody, there may be little or no impingement mortality or entrainment occurring at the site." 69 Fed. Reg. at 41,604. For example, at a nuclear power plant that draws cooling water from (as the EPA posited) a "highly degraded ship channel with few fish and shellfish," *id.* at 41,627, intake structure screens might be just as effective as cooling towers at minimizing adverse impacts on the virtually nonexistent aquatic life.

There is also no reason why the EPA should not be permitted to determine whether energy supply, other environmental, or monetary costs from using a particular technology outweigh the benefits to aquatic life at a particular location. The adverse impacts caused by retrofitting closed-cycle cooling at some nuclear plants—let alone forcing the closure of plants where retrofitting is impossible or infeasible—might well unambiguously outweigh benefits to aquatic life, particularly where those benefits would be unusually small. Such deci-

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[24] The effluent limitation provisions call for the EPA to set standards based on the "degree of effluent reduction" attainable. *See, e.g.*, 33 U.S.C. §§ 1314(b)(2)(A), 1316(a)(1); *see also id.* § 1311(b)(2)(A) (requiring EPA to set standards that "will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants").

sions, applying general policies in light of the specific circumstances of particular sites or situations, are classically ones best made by expert agencies in the implementation of their statutory mandate. This Court should reaffirm the EPA's ability to take the same approach under Section 316(b).

CONCLUSION

The judgment of the court of appeals should be reversed in relevant part.

Respectfully submitted.

ELLEN C. GINSBERG
MICHAEL A. BAUSER
NUCLEAR ENERGY INSTITUTE
1776 I Street, N.W.
Washington, D.C. 20006
(202) 739-8000

SETH P. WAXMAN
Counsel of Record
EDWARD C. DUMONT
BRIAN M. BOYNTON
WILMER CUTLER PICKERING HALE AND DORR LLP
1875 Pennsylvania Ave., N.W.
Washington, D.C. 20006
(202) 663-6000

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AMICUS CURIAE BRIEF

Nos. 07-588, 07-589 & 07-597 (Consolidated)

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In The
Supreme Court of the United States

ENTERGY CORP., *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF OF *AMICUS CURIAE* OMB WATCH IN SUPPORT OF RESPONDENTS

PROFESSOR AMY SINDEN
Counsel of Record
Temple University Beasley School of Law
1719 N. Broad Street
Philadelphia, PA 19122
(215) 204-4969

October 6, 2008

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Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 Mich. L. Rev. 570 (1996) 22

David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. Colo. L. Rev. 335 (2006) 13

Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. Penn. L. Rev. 1553 (2002) 34

Lawrence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 Yale L. J. 1315 (1974) 5

Richard Parker, *Grading the Government*, 70 U. Chi. L. Rev. 1345 (2003) 34

Thomas H. Stevens, et al., *Measuring the Existence Value of Wildlife: What Do CVM Estimates Really Show?* 67 Land Economics 390 (1991) 21, 22

INTEREST OF AMICUS CURIAE

OMB Watch is a nonprofit research and advocacy organization dedicated to promoting government accountability, citizen participation in public policy decisions, and the use of fiscal and regulatory policy to serve the public interest. OMB Watch was founded in 1983 to shed light on the activities and operations of the Office of Management and Budget (OMB). The organization also focuses on the substantive areas that OMB and an agency within it, the Office of Information and Regulatory Affairs (OIRA), oversee: federal regulatory policy, the federal budget, taxation and government performance, information and access, and nonprofit action, advocacy, policy and technology.[1]

SUMMARY OF ARGUMENT

In developing the Phase II rule, EPA relied in part on a formal, economic cost-benefit analysis ("formal CBA"), i.e., an analysis that estimated both the costs and benefits of the rule in monetary terms and compared them. Formal CBA is not a "common sense" tool for "rational" decision making, as petitioners contend. It is a highly controversial decision procedure that often produces irrational results. Congress was extremely skeptical of formal CBA when it passed the Clean Water Act (CWA) and thus declined to provide for it anywhere in the

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[1] The parties have consented to the filing of this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amicus curiae*, their institutions, or their counsel made a monetary contribution to its preparation or submission.

statute, including in § 316(b). Indeed, Congress eschewed formal CBA in every environmental statute it passed in the early 1970s.

Rather than directing agencies to engage in formal CBA, or even a limited cost-benefit balancing, most environmental statutes of that era, including the CWA, directed agencies to employ technology-based standards. Technology-based standard-setting requires the agency to evaluate likely costs of a proposed standard in order to determine whether it is economically feasible (i.e., "available"). But it does not require agencies to delve into the far more problematic task of attempting to quantify and monetize environmental benefits.

The technology-based approach was particularly important to Congress' overhaul of the CWA in 1972 because previous versions of that statute had required agencies to engage in a cumbersome and unworkable evaluation of water quality benefits. In those few instances when Congress did authorize cost-benefit balancing—as it did under the Best Practicable Technology standard—it did not authorize formal CBA. Rather, it directed agencies to perform a limited, qualitative balancing.

The use of formal CBA to evaluate environmental regulation has always been controversial. The practice first became widespread in 1981, when President Reagan signed an executive order requiring all major federal regulations to undergo formal CBA (to be overseen by the OMB's Office of Information and Regulatory Affairs (OIRA)). The executive order did not enjoy bipartisan support. Indeed, many viewed it as a highly partisan effort to delay and weaken regulation.

The application of formal CBA to environmental regulation rests on the untenable assumption that complex effects on ecological and human health can be quantified and expressed in dollar terms. In practice, scientific understandings are rarely fine-grained enough to predict such impacts in quantifiable terms. Even where they are, data are inevitably incomplete. And even for those data that do exist, the process of converting them into dollars raises intractable difficulties that render the results endlessly contestable.

The Phase II rulemaking illustrates these shortcomings. The formal CBA that accompanied it was hopelessly incomplete because EPA was unable to quantify the vast majority of the broad and complex ecological benefits associated with the rule. EPA admitted, for example, that its estimate accounted for less than two percent of the fish subject to impingement and entrainment from cooling water intake structures. Moreover, EPA was unable to find non-controversial methods for monetizing the non-market goods at issue. Finally, after receiving extensive criticism, EPA threw up its hands and simply left most benefits out of the analysis entirely.

The CBA never produced a reliable or meaningful number. The benefits estimate fluctuated wildly, changing by nearly a factor of ten, from $735 million under the proposed rule to $83 million under the final rule. Even the larger number was, by EPA's own frequent admission, hopelessly incomplete. The documents describing the CBA were peppered with caveats and disclaimers, describing the myriad reasons why the benefits figure grossly under-estimated the rule's true benefits.

Yet, despite the innumerable caveats, EPA still resorted to the raw numbers when it came time to

make a decision. At OIRA's urging, it rejected a closed cycle cooling alternative because "the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." 67 Fed. Reg. 17,122, 17,158 (2002). Thus, EPA based its decision on a comparison of an incomplete estimate of benefits with a relatively complete estimate of costs. This is the kind of irrational decisionmaking formal CBA often fosters. Congress rejected formal CBA in § 316(b) for that reason.

ARGUMENT

I. FORMAL CBA, LIKE EPA RELIED ON HERE, IS NOT "COMMON SENSE"; IT IS A SPECIFIC AND CONTROVERSIAL DECISION PROCEDURE THAT CONGRESS PROHIBITED IN THE CWA.

In deciding which of several alternatives to adopt for the Phase II rule—setting the standard under CWA § 316(b) for "minimizing adverse environmental impact" from cooling water intake structures at existing power plants—EPA relied in part on a formal, economic cost-benefit analysis. *See* pp. 28-31, *infra*. By "formal economic cost-benefit analysis" (hereinafter "formal CBA"), we refer to an analysis that estimates a regulation's costs and benefits to society in quantified, monetary terms and then compares them.[2] *See* Economists Frank Ackerman, et al. Amicus Br. 10.

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[2] EPA appears to also contemplate that formal CBA will be used in connection with the site-specific compliance alternative. *See* 67 Fed. Reg. at 17,149 ("EPA believes that a rigorous . . .

This is not, as petitioners contend, simply a "common sense . . . imperative of basic rationality to ensure that actions do more good than harm." Entergy Br. 29. It is a specific and highly controversial decision procedure that Congress considered and rejected in drafting the CWA as a whole, and in § 316(b) in particular. Riverkeeper Br. 6-14, 47-50. Accordingly, the EPA violated § 316(b) by using formal CBA to decide on the Phase II rule, and the judgment of the court of appeals should be affirmed.

II. WHEN THE CWA WAS PASSED, LAWMAKERS WERE HIGHLY SKEPTICAL OF FORMAL CBA.

Congress passed the Clean Water Act in 1972, during a time when many members of Congress viewed formal CBA with considerable skepticism.[3] In negotiations over the wording of § 316(b), the CBA skeptics won out, keeping any provision for formal

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economic analysis should be performed when a facility seeks a site-specific determination of best technology available due to significantly greater cost as compared to the benefits of compliance.").

[3] Congress' skepticism reflected an extensive academic literature critiquing formal CBA. *See, e.g.*, Lawrence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 Yale L. J. 1315 (1974); C. Edwin Baker, *The Ideology of the Economic Analysis of Law*, 5 Phil. & Pub. Aff. 3 (1975). A robust academic critique of CBA continues to this day. *See, e.g.*, Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (2004); Sidney A. Shapiro & Robert L. Glicksman, *Risk Regulation at Risk: Restoring a Pragmatic Approach* (2003); Cass R. Sunstein, *Incommensurability and Valuation in Law*, 92 Mich. L. Rev. 779 (1994); Elizabeth Anderson, *Value in Ethics and Economics* (1993).

CBA or cost-benefit balancing of any kind out of that section. Riverkeeper Br. 12-14, 49-50. Indeed, the CBA skeptics were successful in keeping formal CBA out of the statute entirely. *Id.* at 6-12, 48-49. While a few sections of the CWA call for a limited balancing of costs and benefits, *see* pp. 11-12, *supra*, none allow for formal CBA. Riverkeeper Br. at 12.

A. Congress Eschewed Formal CBA in Every Federal Environmental Statute Passed in the Early 1970s.

Indeed, in every major environmental, health, and safety statute passed during the first half of 1970s, Congress eschewed formal CBA. *See* Cass R. Sunstein, *Risk and Reason* 21-22 (2002) ("[M]ost federal statutes do not call for cost-benefit balancing, and many of them seem to preclude it."); *American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 508-522 (1981) (Occupational Safety and Health Act of 1970 requires feasibility analysis rather than CBA); *Whitman v. American Trucking Ass'ns*, 531 U.S. 457, 467 (2001) (Clean Air Act of 1970 prohibits weighing costs against benefits in promulgation of national ambient air quality standards); *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 173, 184 (1978) (§7 of Endangered Species Act of 1973 prohibits weighing costs against benefits).

Members of Congress were concerned that efforts to quantify and monetize the values associated with human health and the environment would be so controversial and so plagued by uncertainties that agencies would waste valuable time and resources without producing meaningful results. A 1976 House report found these limitations "so severe that they militate against [the] use [of benefit/cost analysis]

altogether." Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, House of Representatives, 94th Cong., *Federal Regulation and Regulatory Reform*, H. Rep. No. 75-931, at 515 (1976). A 1978 Senate study took a similar view:

> Where economic regulation is concerned, [cost-benefit] analysis can be more easily applied, since there the consequences are usually capable of being reduced to dollar and cent terms. Such is not always the case with health, safety and environmental regulation. Here it is extremely difficult to quantify benefits since they are subject to great uncertainty and often become apparent only with the passage of time. In addition, some important benefits—such as recreational or aesthetic values—are difficult if not impossible to quantify in any meaningful way . . . . Therefore there are serious limitations to the use of economic impact analysis in the health and safety area . . . . [D]ecisionmaking to protect the public from serious hazards should not be reduced to those terms.

U.S. Senate Committee on Governmental Affairs, 96th Cong., *Study on Federal Regulation,* S. Doc. No. 96-13, at xxiv (1978). *See also Indus. Union Dep't v. Am. Petroleum Inst.*, 448 U.S. 607, 719 n. 32 (1980) (Marshall, J., dissenting) ("Congress's antipathy toward cost-benefit balancing is evident throughout

the legislative history of the [Occupational Safety and Health] Act.").[4]

Thus, despite petitioners' protestation that Congress "could not possibly have intended" such "absurd" results (Entergy Br. 22), the fact that, in 1972, Congress drafted § 316(b) of the CWA to preclude the use of formal CBA (or indeed any kind of cost-benefit balancing) is not at all surprising.

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[4] In light of Congress' antipathy toward formal CBA, petitioners' suggestion that, unless Congress has explicitly prohibited CBA, "it may be arbitrary and capricious" for an agency *not* to do it, is specious. Entergy Br. 30. The only authority petitioners cite for this proposition is an article by Professor Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 Mich. L. Rev. 1651 (2001), in which he calls on the federal courts to adopt a presumption favoring formal CBA where a statute is silent. *Id.*; *see also* PLF Amicus Br. 5-6 (advocating Sunstein's "default principle"); Entergy Br. 26, n. 8 (same). Here the statute is *not* silent; § 316(b) clearly requires EPA to apply a technology based standard rather than CBA. *See* Riverkeeper Br. 23-33. But even if it were, petitioners' call for the application of a "cost-benefit default principle" would be unavailing. While Professor Sunstein is a widely-respected scholar, as shown above, his proposal is clearly out of step with Congressional intent. This perhaps explains why this Court has repeatedly declined to adopt his default principle. *See Whitman*, 531 U.S. at 467 ("We have . . . refused to find implicit in ambiguous sections of the [Clean Air Act] an authorization to consider costs that has elsewhere, and so often, been expressly granted."); *Donavan*, 452 U.S. at 510 ("When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute."). *See generally* Amy Sinden, *Cass Sunstein's Cost-Benefit Lite: Economics for Liberals*, 29 Col. J. Envtl. L. 191, 228-240 (2004) (critiquing Sunstein's proposal).

B. In Most Environmental Statutes, Congress Directed Agencies to Employ Technology-based Standards, Rather than Formal CBA or Limited Cost-Benefit Balancing.

Rather than directing agencies to engage in formal CBA or even a limited cost-benefit balancing, most environmental statutes of the 1970s, including the CWA, direct agencies to employ technology-based standards. *See, e.g.,* CWA, 33 U.S.C. §§ 1311(b)(2), 1314(b)(2) (effluent limits for point sources based on the "best available technology"); Clean Air Act, 42 U.S.C. § 7411(a)(1) (emissions limits for new sources based on "the best system of emission reduction . . . adequately demonstrated"). Technology-based standard-setting requires the agency to evaluate the likely costs of a proposed standard in order to determine whether it is economically feasible (i.e., "available"). It does not require agencies to delve into the far more problematic task of attempting to quantify and monetize the environmental benefits of regulation in order to compare them to costs. *See* Economists Frank Ackerman, et al. Amicus Br. 16-26.

The technology-based approach was particularly important to Congress' overhaul of the CWA in 1972. Previous versions of the Act had required standard-setting and enforcement to be based on an evaluation of the benefits of regulation—i.e., on assessments of the quality of the receiving waters. *EPA v. California*, 426 U.S. 200, 202-205 (1976). This approach proved to be entirely unworkable—in the words of the Senate Committee on Public Works—"inadequate in every vital aspect." 2 *A Legislative History of the Water Pollution*

Control Act Amendments of 1972, Ser. No. 93-1, at 1423 (1973); S. Rep. No. 92-414, at 7 (1971).

Evaluating the benefits of water pollution reduction was extremely difficult. *California*, 426 U.S. at 202. It required tedious and costly site-specific measurements, as well as assessments of complicated and inadequately understood ecological chains of causation. Technology-based standard setting, on the other hand, allowed EPA to simply set uniform national standards for each industry based on the maximum technologically achievable level of pollution reduction. *Weyerhaeuser v. Costle*, 590 F.2d 1011, 1042 (D.C.Cir. 1978). This only required the agency to evaluate technologies and costs. *See* Economists Frank Ackerman, et al. Amicus Br. 16-26. Thus, one of Congress' primary goals in overhauling the CWA in 1972 was to relieve permitting agencies of the burden of attempting to measure regulatory benefits. *See Ass'n of Pacific Fisheries v. EPA*, 615 F.2d 794, 805 (9th Cir. 1980); Riverkeeper Br. 6-7.

C. In the Few Instances when Congress did Authorize Cost-Benefit Balancing, It Intended a Limited Qualitative Balancing, Not Formal CBA.

Even in the few instances in the early 1970s in which Congress did instruct agencies to compare costs and benefits, it did not expect them to perform a full-fledged, formal CBA. Rather, it directed them simply to perform a rough, qualitative comparison to ensure that costs were not wholly disproportionate to benefits. *See, e.g.*, National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(B) ("insure that presently unquantified environmental . . . values . . . be given appropriate consideration in decisionmaking

along with economic . . . considerations"); NEPA Implementing Regulations, 40 C.F.R. § 1502.23 (NEPA analysis "need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations.").

In the CWA itself, Congress called for a balancing of costs and benefits in conjunction with the Best Practicable Technology standard. In promulgating these interim standards, which were to remain in effect for only a few years, *see* 33 U.S.C. § 1311(b)(1)(A); Riverkeeper Br. 34-35, the statute directed EPA to consider the costs that would be imposed on industry "in relation to the effluent reduction benefits to be achieved." *Id.* at § 1314(b)(1)(B).

Congress did not intend by this language to authorize EPA to engage in formal CBA. This language contemplated no more than a "limited cost-benefit analysis," intended to cull out the most extreme cases where "the additional degree of effluent reduction is wholly out of proportion to the costs." 1 *A Legislative History of the Water Pollution Control Act Amendments of 1972*, Ser. No 93-1, at 170 (1973); *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71, n. 10 (1980)(quoting legislative history); *Weyerhaeuser*, 590 F.2d at 1045 n. 52 (same); *BASF Wyandotte Corp. v. Costle*, 598 F.2d 637, 656-57 (1st Cir. 1979)(CWA imposes obligation on EPA only to perform "limited cost-benefit balancing" which "is a relatively subsidiary task and need not be precise").

Concerned that EPA not be "bog[ged] down in burdensome proceedings" the courts held that "cost need not be balanced against benefits with pinpoint precision." *Weyerhaeuser*, 590 F.2d at 1048. Indeed, EPA was not supposed to monetize the benefits at all. Nor did Congress intend the agency to investigate the

full social benefits of the regulation in the welfare economic sense—that is, to attempt to measure the overall ecological improvement in the quality of the receiving waters. *Pacific Fisheries*, 615 F.2d at 805. Instead, the statute directed EPA to balance only a very simplified version of the benefits: "the effluent reduction benefits," 33 U.S.C. § 1314(b)(1)(B), i.e., the pounds or tons of a pollutant that would be prevented from entering the water. Thus, EPA was simply supposed to hold up the pounds of pollutant reduced next to the dollar costs of the regulation and perform a limited balancing. *Weyerhaeuser*, 590 F.2d at 1047.

D. No Consensus Favors Formal CBA; It has Always been Highly Controversial.

There is *not* a long-standing consensus favoring the use of formal CBA in agency decisionmaking, as petitioners and their amici contend. *See* AEI-Brookings Amicus Br. 8. The widespread use of formal CBA by federal agencies began in 1981, when President Reagan signed Executive Order 12,291, requiring formal CBAs to be prepared for all major federal regulations. 46 Fed. Reg. 13,193 (1981). The executive order was seen at the time as a highly partisan effort to slow regulatory activity. *See* Richard L. Revesz, et al., *Retaking Rationality* 24-29 (2008); *see also* Sunstein, *Risk, supra,* at 20 ("Executive Order 12,291 proved extremely controversial."). Indeed, it explicitly stated that its purpose was "to reduce the burdens of existing and future regulations." 46 Fed. Reg. at 13,193.

The executive order gave authority to oversee agency compliance with the new CBA mandate to the

newly created Office of Information and Regulatory Affairs (OIRA) within the White House Office of Management and Budget. 46 Fed. Reg. at 13,193 (§ 2(b)). This review process, including the relationships and communications between OIRA officials and regulated industries, was "shrouded in secrecy," which only served to heighten the skepticism and suspicion with which many members of Congress and environmental groups viewed OIRA and the CBA mandate. *See* Revesz, *supra,* at 25; *EPA: Investigation of Superfund and Agency Abuses (Part 3): Hearings Before the Subcomm. on Oversight and Investigations of the Comm. on Energy and Commerce*, 98th Cong. 2 (1983) (statement of Rep. John Dingell) ("OMB acts as a conduit for promoting the views of industry affected by proposed regulations through secret, undisclosed, and unreviewable contacts.").

It was widely assumed that OIRA review of regulations under the executive order's CBA mandate would have the effect of delaying and weakening rather than spurring regulation, and that, indeed, has been the effect. *See* David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. Colo. L. Rev. 335, 365, 380 (2006) (Of 25 OIRA reviews studied, 24 resulted in changes that weakened environmental, health, and safety protections.).

Although the Clinton administration pulled back from the explicitly anti-regulatory stance of the Reagan and Bush I administrations, it continued to implement the same basic cost-benefit mandate, replacing Reagan's executive order with a similar one that softened a few edges but kept the essential mandate intact. *See* Exec. Order 12,866, 58 Fed. Reg. 51,735 (1993)(replacing Reagan-era requirement that benefits "outweigh" costs with "reasoned

determination" that benefits "justify" costs); OMB, *Circular A-4*, at 10 (Sept. 17, 2003)("A distinctive feature of [CBA] is that both benefits and costs are expressed in monetary units."), *avail. at*: http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf. Despite the embrace of CBA by the Clinton administration, however, debate among scholars and policymakers continued unabated and continues today. *See* p. 5, note 3, *supra*.

III. CONGRESS ESCHEWED FORMAL CBA FOR GOOD REASON: IT PRODUCES UNRELIABLE AND IRRATIONAL RESULTS

Congress had good reason to be skeptical of the use of formal CBA to evaluate environmental health and safety regulation in the 1970s, and those reasons remain valid today. The application of formal CBA to environmental regulation rests on the untenable assumption that the complex ecological and human health processes that such regulation seeks to protect can be quantified and expressed in dollar terms. In practice, scientific understandings are rarely fine-grained enough to predict impacts in quantifiable terms. Even where they are, data are inevitably vastly incomplete. And even for those quantifiable data that do exist, the process of converting such data into dollar terms raises intractable practical and theoretical difficulties that make most monetized estimates of impacts endlessly contestable. As a result, formal CBA fails miserably at its appointed task. Rather than providing a "common sense" tool for insuring "rational" regulation (Entergy Br. 4, 10, 29), formal CBA produces Alice-in-Wonderland results that are so incomplete and so unreliable, they

provide endless opportunity for manipulation, effectively vesting in agency officials virtually unlimited and unreviewable discretion.

Formal CBA need not pinpoint costs or benefits with a single number. Some range of uncertainty is to be expected from any decisionmaking standard. Results could have some margin of error and still be quite useful. But the difficulties inherent in trying to attach a dollar figure to environmental values—like a human life or clean water or a species or an ecosystem—create uncertainties of such enormous magnitude that no meaningful comparison of costs and benefits is possible.

EPA's CBA of its regulation limiting arsenic in drinking water, cited by amicus Pacific Legal Foundation (PLF Amicus Br. 7), provides a telling example. EPA estimated the costs of that rule to be approximately $206 million, *see* 66 Fed. Reg. 6,976, 7,010 (2001), but a study by Professor Cass Sunstein concluded that reasonable people making reasonable assumptions could peg the benefits of the rule anywhere between a low if $13 million or a high of $789 million. *See* Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 Geo. L. J. 2255, 2288 (2002). EPA presented the benefits as falling somewhere within the modest range of $140 to $200 million. 66 Fed. Reg. at 7017. This presented a false and misleading picture that failed to capture the true magnitude of the uncertainties involved. *See* Sinden, *supra*, at 212-29.

A CBA with this level of uncertainty does not help anyone identify "whether the regulation does more harm than good." (Entergy Br. 21). Rather than "rationalizing" agency decision making (*id.*), it makes it more vulnerable to political distortion. When uncertainties are so large, interest groups can easily

manipulate the numbers to reach their desired outcome.

A. The Data and Scientific Understandings Necessary to Quantify Many Environmental and Health Benefits are Simply Unavailable.

In many instances, we lack the data and/or scientific understanding necessary to make definitive, non-controversial estimates of the environmental benefits of regulation. See, e.g., Hon. Stephen Breyer, *Breaking the Vicious Circle* 45 (1993) (attempt to assess risks associated with aflotoxin in peanuts yielded "[t]wo scientifically plausible models . . . show[ing] risk levels differing by a factor of 40,000."). Quantifying the health benefits associated with the arsenic rule, for example, was no easy task. Various studies linked arsenic to seven different types of cancer as well as to other health effects, but only the studies linking arsenic to lung and bladder cancer provided data in quantifiable form. *See* Sunstein, *Arsenic, supra,* at 2272-74. Even for those cancers, there were no hard data at low doses. *Id.* at 2279-82. From the outset, then, even before any attempt at monetization, the benefits estimate for EPA's arsenic CBA contained a large range of uncertainty and covered only a fraction of the relevant health effects.

1. The CBA of the Phase II Rule was Grossly Incomplete Because EPA did not even Quantify the Vast Majority of the Benefits.

For rules with primarily ecological benefits, the informational problems are even more acute, because so many aspects of ecological processes are

still so poorly understood. Accordingly, EPA has expressed concern that formal CBAs under the CWA have generally "been limited in the range of benefits assessed," thus "hinder[ing] EPA's ability to compare . . . benefits and costs . . . comprehensively." 67 Fed. Reg. at 17,191. EPA found the process of assessing benefits for the Phase II rule similarly "challenging." 69 Fed. Reg. 41,576, 41,655 (2004). Ultimately, its formal CBA failed to include the vast majority of the rule's benefits.

EPA began by estimating the number of fish impinged or entrained at intake structures. *See* 67 Fed. Reg. at 17,190. These impacts vary widely from site to site, depending on the type of aquatic ecosystem that exists there, the size and location of the intake structure, and so on. *See id.* Accordingly, EPA did a series of case studies of facilities in different regions and on different water body types, and used those results to extrapolate estimates of impingement and entrainment for all the facilities in the country. *See* 69 Fed. Reg. at 41,655.

From the outset, of course, estimating the number of fish impinged or entrained leaves out a whole set of other ecological harms caused by cooling water intake, including the loss of non-fish species and impacts on the functioning of the ecosystem as a whole. *See* EPA, *Regional Analysis Document for the Final Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-003, at A9-1 (February 12, 2004) (available at http://www.epa.gov/waterscience/316b/phase2/casestudy/final.htm). Phytoplankton and zooplankton trapped in cooling water intake structures can also be of crucial importance to the aquatic food chain but these losses were not calculated by EPA. Indeed, EPA did not even include the loss of certain commercially valuable large

invertebrate species like lobsters, mussels, crabs, and shrimp because they lacked adequate data. *See* EPA, *Economic and Benefits Analysis (EBA) for the Proposed Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-001, at C1-7 (February 2002) (available at http://www.epa.gov/waterscience/316b/phase2/econbenefits). Nor did EPA include effects on fish-eating birds or on sea turtles and other endangered species. *See* 69 Fed. Reg. at 41,624 ("3,200 threatened or endangered sea turtles entered enclosed cooling water intake canals at the St. Lucie Nuclear Generating Plant in Florida."). Moreover, the agency made no attempt to account for cumulative impacts, *see* EPA, *EBA Proposed Rule, supra*, at C1-6, or the "stresses to overall communities and ecosystems as evidenced by reductions in diversity or other changes in system structure and function," 69 Fed. Reg. at 41,586. EPA acknowledged that while all of these impacts are very important, measuring them is particularly challenging, because "[p]opulation dynamics and the physical, chemical, and biological processes of ecosystems are extremely complex." *Id.*

2. Even for those Benefits EPA did Attempt to Quantify, the Estimate was Grossly Incomplete.

Even for the narrow slice of benefits that EPA did attempt to quantify, its estimates were highly inaccurate and incomplete, as EPA repeatedly acknowledged.

EPA derived its estimate of the magnitude of impingement and entrainment impacts on fish from facility-reported data. 69 Fed. Reg. at 41,656. This introduced yet another source of uncertainty and

inaccuracy. *See* EPA, *EBA Proposed Rule, supra,* at C1-6. Most facilities had never even conducted such studies. *See* EPA, *Economic and Benefits Analysis (EBA) for the Final Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-04-005, at A2-1 (February 2004) (available at http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm). Among those that had, sampling methods and equipment were "highly variable." 69 Fed. Reg. at 41,656. The "data [were] often limited to a subset of species," and were in some instances as much as three decades old. *Id.* EPA observed that as a result of these problems, "the magnitude of impingement and entrainment is often underestimated." 67 Fed. Reg. at 17,190; *see also* EPA, *EBA Proposed Rule, supra,* at C1-6 ("EPA believes that its analysis is likely to lead to potentially significant underestimates . . . of regulatory benefits.").

Once it had estimated the number of fish that are otherwise lost through impingement and entrainment but would be saved by the rule (1.4 billion annually), 69 Fed. Reg. at 41,657, EPA then estimated the number of those fish that would likely be caught by commercial and recreational fishermen. Most fish species are not caught at all. And even among those species that are, harvest rates are usually less than 20 percent. Accordingly, the number of affected fish that EPA actually counted was vanishingly small:

> Of the organisms which are anticipated to be protected by the section 316(b) Phase II rule, it is projected that approximately 1.8 percent will eventually be harvested by commercial and recreational fishers and therefore

> can be valued with direct use valuation techniques. The Agency's direct use valuation does not account for the benefits from the remaining 98.2% of the age 1 equivalent aquatic organisms estimated to be protected nationally under today's rule.

Id. at 41,660-61.

This estimation was, as EPA acknowledged, grossly incomplete, since the fish that survive uncaught have an obvious ecological value. They will reproduce to sustain the population that will be fished on in future years, they will provide food for other fish, and undoubtedly play other important roles in the larger ecosystem as well. *See id.* at 41,657. This methodology generated considerable controversy and illustrates the high degree of indeterminacy that attempts to quantify natural resource values can create. For example, natural resource economist Frank Ackerman, Ph.D., of Tufts University, commented on the proposed rule, criticizing EPA's incomplete accounting of fish mortality. *See* J.A. 211-244. He argued that a more reasonable methodology that took into account the value of the fish that were not caught would have the effect of doubling EPA's benefits estimate. J.A. 223.

In sum, EPA's benefits estimate was hopelessly incomplete, encompassing only a tiny fraction of the total benefits of the Phase II rule. Many aspects of the rule's benefits were left off the ledger sheet entirely because EPA simply lacked the data necessary to assess them. Even with respect to the benefits for which EPA did have some limited data—avoidance of impingement and entrainment impacts

on fish—EPA's estimate accounted for less than two percent of the impacted fish.

B. Techniques for Assigning Monetary Values to Non-Market Goods are Unreliable and Highly Contestable.

Formal CBA requires the analyst to attach dollar figures to values that have no price—human lives, healthy ecosystems, endangered species. For many, the very thought of attempting to assign a dollar price to such intangibles defies common sense. At a minimum, the practice proves extremely controversial. While economists have developed a number of methods for deriving "shadow prices" for non-market goods, the numbers they produce are inevitably soft and highly contestable.

Often, in order to attach a dollar figure to unpriced natural resources, analysts resort to public opinion polls. In what is called the "contingent valuation method" (CVM), analysts give members of the public information about a particular good—the preservation of an endangered species, or the maintenance of clean air or clean water—and then ask how much they would be willing to pay for it. Thomas H. Stevens, et al., *Measuring the Existence Value of Wildlife: What Do CVM Estimates Really Show?* 67 Land Economics 390 (1991); *see* 67 Fed. Reg. at 17,150 (suggesting use of contingent valuation in CBAs for site-specific BTA determinations). One such survey found the average person willing to pay $19.28 per year to prevent the extinction of bald eagles. *See* Stevens, *supra,* at 396.

Studies like these never produce hard numbers. They are inevitably subject to challenge on a variety of methodological grounds. The survey may

be criticized for the amount or objectivity of the background information provided, the way questions are phrased, the fact that respondents are not subject to actual budget constraints, or the geographic scope of the survey. *See id.* at 396-99. If EPA were to conduct a contingent valuation survey on the endangered sea turtles lost in cooling water intake structures in Florida, for example, would it be appropriate to count the willingness-to-pay of all people in Florida, everyone in the U.S., or everyone in the world? There is no consensus on how to handle such problems, yet outcomes can vary widely—by orders of magnitude—depending on how they are resolved. *See* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 Mich. L. Rev. 570, 640 (1996). Accordingly, the results of any such study are inevitably vulnerable to reasonable arguments that they should be adjusted significantly up or down. Alternatively, agencies put off by the expense and controversy may forego such studies and simply leave non-market goods out of the calculation altogether.

1. The CBA for the Phase II Rule was Grossly Incomplete Because EPA was Unable to Find Non-Controversial Methods for Monetizing Non-Market Goods.

The vast majority of the benefits associated with the Phase II rule involved ecological values that EPA was simply unable to quantify or monetize. The only aspects of the benefits that directly involved a market good were the commercial fish species that would be saved from impingement and entrainment. EPA estimated this value by simply calculating the market price of the additional commercial fish that

would be caught under the rule. 69 Fed. Reg. at 41,659-60.

To account for the value of the recreationally caught fish, EPA used a "random utility model," which inferred anglers' willingness-to-pay for recreational fishing based on their travel costs for visiting particular fishing sites and then used a mathematical model to estimate how that willingness-to-pay would likely increase in response to increased catch levels. EPA, *Regional Analysis, supra,* at A11-1 to A11-13; 69 Fed. Reg. at 41658-57.

Even putting aside the uncertainties and questionable assumptions associated with EPA's valuation of recreational fishing, the fishing benefits that EPA actually counted represented only a very small slice of the full spectrum of environmental benefits associated with the rule. First, EPA's estimate of commercial and recreational fishing benefits accounted for less than two percent of the total number of aquatic organisms subject to impingement and entrainment. *See* pp. 19-20, *supra.* Second, even had they accounted for one-hundred percent of the fish killed by impingement and entrainment, this would have covered only a very narrow slice of the broad and complex harms caused by cooling water intake structures.

In the documents supporting its CBA, EPA acknowledged this significant limitation in its analysis and itemized the wider ecological harms its CBA omitted. EPA, *Regional Analysis, supra,* at A9-1. The list is too long to reproduce here, but included, for example, the fact that "[f]ish are essential for energy transfer in aquatic food webs, regulation of food web structure, nutrient cycling, maintenance of sediment processes, redistribution of bottom substrates, the regulation of carbon fluxes

from water to the atmosphere, and the maintenance of aquatic biodiversity." *Id.*

EPA had no way of valuing most of these broader ecological impacts, both because they involve processes that are only dimly understood by science, and because they involve goods and services not traded in markets. Accordingly, EPA simply left most of these values off the balance sheet altogether. The agency did, however, make an attempt to include two aspects of these non-market benefits in its quantified estimate: 1) the benefits of increased survival of "forage" species (fish that other species prey on), and 2) non-use benefits of the aquatic ecosystem. As the next two sections explain, however, even these attempts were largely unsuccessful.

a) EPA Used a Method for Estimating the Benefits of Increased Forage Species Survival that Measured "Only a Small Share of these Losses."

EPA initially used one of two methods to attempt to estimate the benefits of increased forage species survival, depending on the region. In most regions, it used "estimates of trophic transfer efficiency to relate foregone forage production to foregone commercial and recreational fishery yields." 67 Fed. Reg. at 17,191. EPA acknowledged that this method was highly incomplete in that it measured "only the small share of these losses, . . . namely the contribution of the forage species to the increased biomass of landed recreational and commercial species." *Id.* at 17,193. As such, this method left out the myriad other ecological functions such species undoubtedly serve.

In a few regions, EPA initially used a Habitat Replacement Cost analysis instead, which used the projected costs of habitat replacement programs for various species suffering impingement and entrainment losses as a proxy for the value of forage species losses. *Id.* at 17,191. EPA viewed this method as considerably more comprehensive, in part because of its "recognition that impingement and entrainment losses have impacts on all components of the aquatic ecosystem . . . beyond that estimated by reduced commercial and recreational fish catches." *Id.* This method also posed problems, however. EPA acknowledged that it did "not take into consideration ecological problems associated with introducing hatchery fish into wild populations." *Id.* And it generated significant controversy. In comments on the proposed rule, natural resource economist, Robert Stavins, Ph.D. of Harvard University, criticized the Habitat Replacement Cost method as "completely illegitimate" and "fatally flawed." J.A. 234.

In the final rule, EPA abandoned the Habitat Replacement Cost analysis altogether. Instead, it used the far lower (and less complete) numbers generated by the trophic transfer model, noting that estimating the value of forage species is "challenging." 69 Fed. Reg. at 41,657; *see* EPA, *Regional Analysis*, *supra*, at A15-1. Ultimately, then, EPA's estimate of the benefits of increased survival of forage species was, by its own admission, significantly incomplete.

b) Although EPA Believed that "Non-Use Benefits may be Significant," It Ultimately Assigned them a Value of Zero.

"Non-use values" are the values people attribute to resources they have no intention of ever using or experiencing directly. These are sometimes referred to as "existence values" or "bequest values." EPA, *Case Study Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-001, at A9-10 (February 2002) (available at http://www.epa.gov/waterscience/316b/phase2/casestudy). Often such values are estimated using contingent valuation studies, which can be quite controversial. *See* pp. 21-22, *supra*. But in this instance, EPA lacked the resources to even conduct such studies. *See* EPA, *Case Study, supra,* at A9-10.

Instead, EPA applied a "rule of thumb" based on a 1977 study, which inferred that non-use values associated with water-quality improvements were typically 50 percent of recreational use values. *See id.* 67 Fed. Reg. at 17,149. As described above, EPA's estimate of recreational use values was itself based on shadow pricing methods that were far from precise. *See id.* at 17,193 ("[N]onuse benefits are most likely understated using the 50 percent rule because the recreational values used are likely to be understated."). Perhaps predictably, then, EPA's 50-percent rule of thumb came under considerable fire during the comment period. Economist Robert Stavins argued that the 50-percent rule was far too high. J.A. 231, 233. Economist Frank Ackerman, on the other hand, argued that it was too low and that based on more recent literature, non-use value should be estimated at two-times use value. J.A. 220.

Ultimately, when it came to the final rule, EPA threw up its hands and attached no monetary value to non-use benefits at all. It explained in the preamble that while there was "evidence that non-use values could occur as a result of this rule, . . . EPA

was unable, by the time of publication . . . to estimate reliable valuations . . . [or] to fully develop and analyze . . . non-use benefit approaches." 69 Fed. Reg. at 41,657; *id.* at 41,666 (EPA believes omitted "non-use benefits may be significant."); *id.* at 41,662 (same).

By EPA's own admission, then, even the CBA that accompanied the proposed rule vastly underestimated the benefits. But by the time it issued the final rule, EPA had backed away from so many of the methods it had originally used to try to value non-market goods that its benefits estimate had shrunk by nearly ten-fold. Thus, while the total benefits estimate for the proposed rule was $735 million, EPA, *EBA Proposed Rule, supra,* at D1-4, the benefits estimate associated with the final rule was just $83 million. 69 Fed. Reg. at 41,666.

C. EPA'S Estimate of Benefits for the Phase II Rule was Grossly Incomplete, Making Any Comparison with Costs Irrational and Misleading.

The story of the Phase II rulemaking provides a helpful illustration of how formal CBA so often produces results that actually serve to undermine "common sense" and "rational" decision making. Entergy Br. 4, 29. EPA's estimate of the benefits of the rule was so hopelessly unreliable and incomplete that any attempt to compare it with the costs was patently irrational. Thus, rather than clarifying the relevant issues and helping to identify "whether the regulation did more harm than good" (*id.* at 21), formal CBA in this instance actually served to obscure relevant issues and mislead decisionmakers.

Even EPA's own estimates of the benefits of its regulation varied wildly—by a factor of nearly ten—between the proposed and final rules. This disparity resulted largely from the fact that the methods for monetizing non-market ecological values are so inadequate and so contestable. In the end, after receiving extensive criticism on its CBA for the proposed rule, EPA threw up its hands and simply left most benefits out of the analysis entirely.

In reporting the costs and benefits of the final rule, EPA flatly acknowledged that its benefits estimate was incomplete, making a meaningful comparison with costs impossible: "EPA notes that these analyses are based on a comparison of a partial measure of benefits with a complete measure of costs; therefore, the results must be interpreted with caution." 69 Fed. Reg. at 41,666; *see* EPA, *EBA Final Rule, supra,* at D1-5 ("A comparison of complete costs and incomplete benefits does not provide an accurate picture of net benefits to society."). But even the far larger estimate of benefits that accompanied the proposed rule was, by EPA's own admission, grossly incomplete. Throughout the preamble to the proposed rule, EPA repeatedly pointed out the weaknesses in its analysis that likely caused it to underestimate benefits.

1. *OIRA Pressured EPA into Weakening its Proposed Rule on the Basis of the Highly Flawed, Incomplete, and Irrational Results of its CBA.*

Nonetheless, it appears to have been on the basis of this highly flawed, incomplete, and irrational CBA that OIRA pressured EPA into changing its proposed rule. EPA's originally proposed rule

identified closed cycle cooling as the best technology available for the 59 largest and most environmentally damaging facilities of the 539 subject to the rule. EPA, *OMB Review Draft for the Proposed Section 316(b) Rule for Large Cooling Water Intake Structures at Existing Power Generating Facilities*, Docket W-00-32, DCN # 4-4005, p. 72 (Dec. 28, 2001). These were facilities that either were "located on a tidal river or an estuary" and had "an intake flow that exceeds one percent of the tidal excursion" or were "located on an ocean" and had "an intake flow that exceeds 500 [million gallons per day]." *Id.*

EPA based this proposal on its findings that closed-cycle cooling "is the most effective technology for reducing both entrainment and impingement," *id.* at 75, that closed-cycle cooling is "commercially available and economically achievable" and already in use at 21 percent of existing facilities, *id* at 74-75, and that "facilities can and have installed these technologies years after the facility began operation," *id* at 75. Additionally, EPA found that "the compliance costs for [this proposal] would . . . be low compared to firm-level revenues." *See* 67 Fed. Reg. at 17,158 (82% of firms would incur compliance costs of less than 0.5 % of revenues). Accordingly, this proposal met the "best available technology" test of section 316(b) with flying colors. *See* Economists Frank Ackerman, et al. Amicus Br. 16-23.

When it came to formal CBA, on the other hand, EPA was prescient. Anticipating the conclusion it would ultimately reach two-and-a-half years later after completion of the final rule, the agency stated that "EPA cannot perform a complete benefit-cost comparison because not all of the benefits resulting from the proposed regulatory alternative can be valued in dollar terms." EPA, *OMB Review*

Draft, *supra*, at 211. At this stage, EPA's formal CBA was not nearly complete: In many places the draft contained "X's" in lieu of numbers that were to be filled in later. *Id.* at 205, 211-12. But EPA could tell, even then, that the analysis would not ultimately be able to quantify enough aspects of the benefits of the proposed rule to provide a rational comparison with costs.

On December 28, 2001, after years spent researching and preparing the proposed rule, EPA submitted it to OIRA for review. 67 Fed. Reg. at 17,208. The rule that emerged 60 days later was drastically changed. The OIRA review process resulted in 58 "major changes" to the rule, including the removal of the closed cycle cooling requirement for the 59 most damaging facilities and the addition of a provision allowing a site-specific determination of permit requirements based on a cost-benefit analysis. See EPA, *Summary of Major Changes During Interagency Review*, Docket W-00-32, DCN # 4-4005, at 1 (2002).

Although records of the communications between EPA and OMB during the review process have not been made public, we can surmise the rationale for the change by comparing the preamble to the proposed rule that was ultimately published in the Federal Register with the preliminary draft EPA submitted to OIRA. In the proposed rule, the closed cycle cooling requirement was demoted from the preferred option to an alternative option. 67 Fed. Reg. at 17,156-58. In describing this option in the preamble to the proposed rule, EPA reiterated all the reasons it would be a good option, including its economic practicality. *Id.* at 17,158. The only rationale EPA offered for why this option might ultimately be rejected was formal CBA. "EPA notes

that the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." *Id.* We can only surmise that this was the rationale OIRA used to push EPA to change the rule, since OIRA's mandate, after all, is to ensure implementation of the mandate for formal CBA in Executive Order 12,866. *See* pp. 12-14, *supra*.

2. Although EPA Cited Its Formal CBA as the Basis for Rejecting the Closed Cycle Alternative, the Proposed Rule Preamble went on to Cite Dozens of Reasons the Benefits were Under-Estimated.

Thus, the EPA rejected the more stringent closed cycle alternative on the grounds that its formal CBA showed the marginal costs of that alternative outweighing its marginal benefits. 67 Fed. Reg. at 17,158. Nonetheless, the remainder of the preamble to the proposed rule went on to systematically undermine that conclusion by repeatedly citing the myriad reasons EPA believed its analysis had under-estimated the real magnitude of the rule's benefits. *See, e.g., id.* at 17,194-96 (repeatedly noting "several critical caveats and limitations of the analysis"). The preamble is peppered with literally dozens of such disclaimers. *See, e.g., id.* at 17,190 ("the magnitude of impingement and entrainment is often underestimated."); *id.* at 17,192 ("Secondary impacts . . . [like] effects on marinas, bait sales, property values, and so forth are not included, even though they may be significant."); *id.* ("Current fishing mortality rates (and resulting estimates of yield) often reflect depleted fisheries, not what the fisheries should or could be if not adversely impacted by

impingement and entrainment and other stressors."); *id.* at 17,193 ("Forage losses are often valued at only a fraction of their potential full value."); *id.* ("Impacts on threatened and endangered species are not fully captured.").

Indeed, references to the benefits being "underestimated" or "understated" appear 23 times in the preamble. *See id.* at 17,190-203. Nowhere does it state that the benefits have been either overstated or overestimated. At one point, EPA entertained that possibility, *see id.* at 17,192 ("the Agency's benefits estimates could be either over- or under-estimated"), but then quickly dismissed it:

> However, because of the many factors omitted from the analysis (typically because of data limitations) and the manner in which several key uncertainties were addressed, EPA believes that its analysis is likely to lead to a potentially significant underestimate of baseline losses and, therefore lead to understated estimates of regulatory benefits.

Id.

Natural resources economist Frank Ackerman, Ph.D., in comments submitted on the proposed rule, suggested that even just correcting for a few of the many inaccuracies in EPA's benefits estimate would yield an estimate 4-6 times as high. J.A. 223. If that were true, then the abandoned closed cycle option would probably actually pass an incremental cost-benefit test. *See* 67 Fed. Reg. at 17,158.

3. The Phase II Rulemaking Illustrates How CBA Undermines Rational Agency Decisionmaking.

The story of the Phase II CBA illustrates why formal CBA so often leads to irrational results that defy common sense and actually obscure the factors relevant to discerning whether a regulation does more harm than good. The benefits estimate for the Phase II rulemaking never produced anything even approaching a reliable or meaningful number. Indeed, the numerical estimate jumped wildly between the proposed and final rules, changing by nearly a factor of ten, from $735 million under the proposed rule to $83 million under the final rule. *See* p. 27, *supra*.

Even the larger number was, by EPA's own frequent admission, grossly and hopelessly incomplete. The documents describing the CBA were peppered with caveats and disclaimers, describing the myriad reasons why the benefits figure grossly underestimated the true benefits of the rule.

Yet, despite the innumerable caveats, EPA still resorted to the raw numbers when it came time to make a decision. It rejected the closed cycle cooling alternative because "the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." 67 Fed. Reg. at 17,158. This time there were no caveats or disclaimers.

This is not an unusual story. One of the problems with formal CBA is that, no matter how many narrative explanations, caveats and qualitative descriptions are included in the analysis, regulators face an irresistible temptation to reduce formal CBA to its raw numbers. In this way, they can make

decisions look easy and definitive rather than difficult and ambiguous. *See* Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. Penn. L. Rev. 1553, 1579-80 (2002) (unquantifiable benefits often given lip service in CBA but ultimately ignored; citing arsenic CBA as example where "[s]ubsequent public discussion [of the CBA] inevitably referred only to the EPA's numerical analysis and forgot about the cases of avoided illness that could not be quantified"); Richard Parker, *Grading the Government*, 70 U. Chi. L. Rev. 1345, 1348-49, 1404-06 (2003) (observing increasingly prevalent phenomenon of "regulatory score cards," which "reduce . . . hundreds of pages [in a CBA] to a few summary statistics").

But, as the Phase II rule illustrates, when monetary estimates of benefits and costs are grossly incomplete and highly contestable, as they so often are, attempting to compare them "does not provide an accurate picture of net benefits to society." EPA, *EBA Final Rule, supra,* at D1-5. On the contrary, it leads to irrational results that actually obscure the relevant issues behind a false veneer of scientific objectivity and accuracy. In this way CBA actually reduces the transparency and rationality of government decisionmaking.

Rather than rationalizing and disciplining agency decision making, formal CBA actually renders agency decision making more vulnerable to interest group pressure. Because the numbers it produces are so unreliable and contestable, an interest group unhappy with the result can almost always find an economist who can make a credible argument for the opposite outcome. Indeed, Professor Cass Sunstein

made this observation in connection with his careful analysis of EPA's formal CBA of the arsenic rule:

> We are now in a position to see the multiple possible challenges to any agency decision that involves cost-benefit balancing . . . . We can see how creative citizens and lawyers, representing water systems or environmentalists, might be able to mount reasonable challenges to EPA's decisions, regardless (almost) of the content of those decisions.

Sunstein, *Risk, supra,* at 179. Thus, rulemaking devolves into a contest over which interest group has the resources to hire the best credentialed economists rather than which side has the better argument.

In sum, formal CBA often undermines rational agency decisionmaking. That occurred in this case, when EPA, at OIRA's urging, rejected the closed cycle alternative on the grounds of a comparison of the raw numbers produced by its formal CBA. EPA compared a monetary estimate of benefits that was hopelessly unreliable and incomplete to a relatively compete estimate of costs and used the results of this fuzzy math to justify its decision.

CONCLUSION

Formal CBA of the type used by EPA in this case undermines rational decisionmaking because it inevitably produces incomplete, unreliable, and contestable results. It requires analysts to attach a dollar figure to values like human lives, healthy ecosystems, and endangered species that cannot be

meaningfully or reliably quantified and monetized. Formal CBA is not a common sense tool for rational decision making, but a very specific and highly controversial method for evaluating regulations. Congress had good reason to prohibit its use under the CWA in general and under § 316(b) in particular.

Respectfully submitted.

PROFESSOR AMY SINDEN
Counsel of Record
Temple University Beasley School of Law
1719 North Broad Street
Philadelphia, PA 19122
(215) 204-4969

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AMICUS CURIAE BRIEF

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v.

ENVIRONMENTAL PROTECTION AGENCY, et al.,

Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF AMICUS CURIAE OF PACIFIC LEGAL FOUNDATION IN SUPPORT OF PETITIONERS

BRANDON M. MIDDLETON
Of Counsel
Pacific Legal Foundation
3900 Lennane Drive,
Suite 200
Sacramento, California 95834
Telephone: (916) 419-7111
Facsimile: (916) 419-7747

M. REED HOPPER
*STEVEN GEOFFREY GIESELER
**Counsel of Record*
Pacific Legal Foundation
1002 SE Monterey Commons
Boulevard, Suite 102
Stuart, Florida 34996
Telephone: (772) 781-7787
Facsimile: (772) 781-7785

Counsel for Amicus Curiae
Pacific Legal Foundation

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QUESTION PRESENTED

Whether Section 316(b) of the Clean Water Act, 33 U.S.C. § 1326(b), authorizes the Environmental Protection Agency (EPA) to compare costs with benefits in determining the "best technology available for minimizing adverse environmental impact" at cooling water intake structures.

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IDENTITY AND INTEREST OF AMICUS CURIAE

Pursuant to Supreme Court Rule 37, Pacific Legal Foundation (PLF) respectfully submits this brief amicus curiae in support of Petitioners Entergy Corporation, et al.[1]

PLF is a nonprofit, tax-exempt corporation organized under the laws of the State of California for the purpose of engaging in litigation in matters affecting the public interest. PLF attorneys represented the petitioner in this Court in *Rapanos v. United States*, 547 U.S. 715 (2006), a case addressing the scope of the Clean Water Act (CWA). PLF has participated as amicus curiae in this Court on matters concerning the various federal environmental statutes, including the CWA, in cases such as *Borden Ranch P'ship v. United States Army Corps of Engineers*, 537 U.S. 99 (2002), *Solid Waste Agency of N. Cook County v. United States Army Corps of Engineers*, 531 U.S. 159 (2001), *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121 (1985), and *Hodel v. Virginia Surface Mining and Reclamation Ass'n, Inc.*, 452 U.S. 264 (1981).

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[1]Pursuant to this Court's Rule 37.3(a), all parties have consented to the filing of this brief. Letters evidencing such consent have been filed with the Clerk of the Court.

Pursuant to Rule 37.6, Amicus Curiae affirms that no counsel for any party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than Amicus Curiae, its members, or its counsel made a monetary contribution to its preparation or submission.

Amicus considers this case to be of special significance in that agency use of cost-benefit analysis within the environmental regulatory framework is crucial to maximizing regulatory efficiency and maintaining a legitimate balance between economic realities and the protection of our natural resources.

SUMMARY OF ARGUMENT

Legal writers have conducted a long and vigorous debate on the merits of cost-benefit analysis within the environmental regulatory system. "That debate appears to be terminating with a general victory for the proponents of cost-benefit analysis." Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 Mich. L. Rev. 1651, 1655 (2001). This comparison of regulatory costs and benefits, long advocated by "many prominent legal academics–including Cass Sunstein, Richard Posner, and Justice Stephen Breyer," Stephen Clowney, Note, *Environmental Ethics and Cost-Benefit Analysis*, 18 Fordham Envtl. L. Rev. 105, 107 (2006), is and has been a common feature in regulatory regimes spanning several decades and the expanse of the partisan divide. Sunstein, 99 Mich. L. Rev. at 1655-56 (noting executive orders requiring cost-benefit analysis signed by Presidents Reagan, George H.W. Bush, and Clinton). Indeed, the relevant regulatory question currently is how to implement cost-benefit analysis of environmental regulations, and not whether it should be implemented at all. *Id.* at 1655.

This resolution is a net positive for the American public for several reasons. Regulations subject to cost-benefit analyses tend to result in better protection against real harm than do regulations promulgated pursuant to other principles such as feasibility-based assessments. Matthew D. Adler & Eric A. Posner,

Rethinking Cost-Benefit Analysis, 109 Yale L.J. 165, 167-69 (1999). Relatedly, cost-benefit analysis of environmental regulations also results in a more effective allocation of limited regulatory funds and a better balance between protection against real harm and the public's need for market efficiency. Robert W. Hahn & Cass R. Sunstein, *A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-Benefit Analysis*, 150 U. Pa. L. Rev. 1489, 1489-90 (2002). Finally, commitment to cost-benefit analysis demands transparency from regulatory agencies, making them more accountable to all branches of government and thus to the American citizenry. Eric A. Posner, *Controlling Agencies with Cost-Benefit Analysis: A Positive Political Theory Perspective*, 68 U. Chi. L. Rev. 1137, 1138-40 (2001).

This Court perhaps anticipated this result in favor of cost-benefit analysis in its decision in *American Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490 (1981). In that case, this Court held that the Occupational Safety and Health Act did not require the Secretary of Labor to complete a cost-benefit analysis in promulgating regulations, but said nothing to constrain agencies' discretion to do so when Congress is silent on the issue. The court below erred in holding to the contrary, and for that reason—along with the positive policy implications of cost-benefit analysis of environmental regulations—this Court should reverse the Second Circuit's decision.

ARGUMENT

I

COST-BENEFIT ANALYSIS OF ENVIRONMENTAL REGULATIONS BENEFITS THE AMERICAN PUBLIC

A. Regulations Subject to Cost-Benefit Analysis Better Protect the Public Against Environmental Harms

Regulatory agencies work with finite budgets. For every dollar spent addressing a given harm, one less dollar can be spent on another. Therefore, it only makes sense that when an agency considers a given course of action, it should account for the opportunity costs—relative to foregone regulatory targets—inherent to that decision. This principle has informed the executive orders of every president since Ronald Reagan that have required a comparison of costs and benefits in government action. Sunstein, 99 Mich. L. Rev. at 1655-56. So too has it found favor with the judiciary, with the D.C. Circuit, for example, holding that "it is only where there is 'clear congressional intent to preclude consideration of cost' that we find agencies barred from considering costs." *Michigan v. EPA*, 213 F.3d 663, 678 (D.C. Cir. 2000) (citations omitted).

This principle of rational rule-making was elucidated further by Justice Breyer in his concurrence in *Whitman v. American Trucking Associations*:

> In order better to achieve regulatory goals–for example, to allocate resources so that they save more lives or produce a cleaner environment–regulators must often

> take account of all of a proposed regulation's adverse effects, at least where those effects clearly threaten serious and disproportionate public harm. Hence, I believe that, other things being equal, we should read silences or ambiguities in the language of regulatory statutes as permitting, not forbidding, this type of rational regulation.

531 U.S. 457, 490 (2001) (Breyer, J., concurring in part and concurring in the judgment). Such statutory silence is at issue in the present case, and this Court should follow Justice Breyer's prescription for assessing it.

Justice Breyer is not alone in his citation of the normative benefits of comparing costs and benefits in environmental regulations. In fact, this position is one held even by many who argue that the current regulatory regime doesn't go far enough. *See, e.g.*, Paul Boudreaux, *Environmental Costs, Benefits, and Values: A Review of Daniel A. Farber's Eco-Pragmatism*, 13 Tul. Envtl. L.J. 125, 126, n.62 (1999) (noting Daniel Farber's "pragmatic approach" that includes "the cost-benefit balance of economic analysis" and that "[e]ven environmentalist Christopher Stone has written that environmental law cannot succeed unless it takes account of the economic costs of prevention, and that economic analysis provides a good way of making compromises between costs, benefits, and competing demands").

Professor Cass Sunstein is a preeminent legal scholar on cost-benefit analysis. In establishing his preferred rules that would constitute an ideal set of default principles for cost-benefit regulatory analysis, Sunstein writes:

> Unless Congress has clearly said otherwise, agencies will be permitted to balance the health risks created by regulation against the health benefits created by regulation . . . Unless Congress has clearly said otherwise, agencies will be permitted to take costs into account in issuing regulations . . . Unless Congress has clearly said otherwise, agencies will be expected to balance costs against benefits in issuing regulations.

Sunstein, 99 Mich. L. Rev. at 1668. This general approach is consistent with that of the D.C. Circuit in *Michigan v. EPA*, 213 F.3d at 678, and with Justice Breyer's concurrence in *Whitman*, 531 U.S. at 490.

Sunstein advocates such default rules because he recognizes the tangible benefits of cost-benefit analysis as well as the deficiencies of regulations issued without it. His writing makes frequent reference to the fallibility of human decision making based not on quantitative data but on gut instinct or popular panic, or what he terms "intuitive toxicology." Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 Geo. L.J. 2255, 2257 (2002). Cost-benefit analysis "provides an important improvement over the 'intuitive toxicology' of ordinary people, in which general affect helps to determine judgment. This intuitive toxicology can lead people to large blunders in thinking about risk . . . ." *Id.* This understanding of the way human beings make decisions, and the capacity for cost-benefit analysis to act as a corrective, recommends comparing costs and benefits at least as readily as does a more traditional economics approach. Sunstein, 99 Mich. L. Rev. at 1161-62. As one author puts it somewhat more colloquially, citing Sunstein's work: "Ordinary people,

it seems, have tremendous difficulty calculating probabilities and appreciating risks. Proponents of quantitative decision-making argue that CBA helps overcome these mental glitches . . . ." Clowney, 18 Fordham Envtl. L. Rev. at 115.

Sunstein employs the example of arsenic in drinking water as a prime case of an agency frittering away precious energy and resources attacking a problem that really wasn't one, and thus necessarily not attending to legitimately dangerous environmental risks. Most people, including the heads of regulatory agencies, tend to adhere to

> a set of simple rules for thinking about environmental risks. Among those simple rules is a belief that substances that cause cancer are unsafe and should be banned [without understanding] that low levels of admittedly carcinogenic substances should sometimes be tolerated because the risks are low and the costs of eliminating them are high.

Sunstein, 90 Geo. L.J. at 2262-63. More generally, "literature from law and psychology journals identifies a handful of cognitive failures that repeatedly mar the decision-making process. For one, people tend to evaluate risks based on easily accessible information—like personal experiences and media coverage—rather than on complete scientific data." Clowney, 18 Fordham Envtl. L. Rev. at 115-16 (citing misconceptions about nuclear power and pesticides as examples).

A true comparison of costs and benefits, on the other hand, reduces the chances of codifying such

misconceptions and diverting resources away from legitimate threats. This is not to advocate for a complete technocracy, nor for the elimination of democratic control over regulatory agencies (to the contrary, cost-benefit analysis makes these agencies more democratic, *see* Part I(C) below). Instead, the comparison of costs and benefits is a way to "ensure that when government acts, it does so with some understanding of the likely consequences." Sunstein, 90 Geo. L.J. at 2263.

The affinity of Sunstein, and others, for cost-benefit analysis does not occur in a vacuum. Their work compares the merits of such analyses and other frameworks for regulatory decision making, and finds the alternatives either lacking or incomplete without themselves including a cost-benefit analysis:

> Some suggested alternatives to cost-benefit analysis are nothing of the kind. . . . [C]ost-benefit analysis is not an alternative to technology-based regulation; it is a tool for assessing what kind of regulation makes best sense. Similarly, cost-benefit analysis assists in evaluating pollution trading . . . . In any trading system it is necessary to 'cap' overall emissions, and cost-benefit analysis is a way of helping to decide on the most sensible cap.

Hahn & Sunstein, 150 U. Pa. L. Rev. at n.42.

Real world examples abound where cost-benefit analysis has resulted in more effective, and efficient, environmental regulation. This happens not just where comparing costs and benefits reveals that, as "in many cases, regulations seem to do more harm than

good." *Id.* at 1490 (citing a 2000 study by Hahn finding that over half of regulations examined actually were likely to *increase* the risk of mortality). "Cost-benefit analysis has also led to regulations that accomplish statutory goals at lower cost, or that do not devote limited private and public resources to areas where they are unlikely to do much good." Sunstein, 99 Mich. L. Rev. at 1661. Sunstein identifies asbestos regulations, the control of CFCs, and Great Lakes pollution rules as areas where cost-benefit analysis "helped regulators produce modifications [to regulations] that significantly reduced costs." *Id.*

So too does cost-benefit analysis often assist in persuading decision makers, and the public, that a regulation is necessary where, in the absence of such analysis, a risk would have been overlooked. One author cites the case of leaded gasoline as a prime example. Industry groups strongly opposed gasoline regulations proposed by the EPA in 1984, and largely had succeeded in downplaying the risk posed by lead. Clowney, 18 Fordham Envtl. L. Rev. at 133-34. It was only when the EPA undertook a comprehensive cost-benefit analysis of the proposed regulation and publicized the results, including the finding that "benefits of reducing lead in gasoline would exceed the costs by more than 300 percent," that the public's opinion, and that of the decision makers at the EPA, turned in favor of the proposed regulation. *Id.* at 133. Matthew Adler and Eric Posner, writing in the Yale Law Journal, found similar outcomes regarding the regulation of agricultural pesticides and lead in drinking water. Not until costs and benefits of acting and not acting were quantified did agency decision makers conclude that the regulation of these dangers were rational undertakings; without the insight of cost-

benefit analysis, these dangers possibly would have gone unaddressed. Adler & Posner, 109 Yale L.J. at 172-74.

B. Cost-Benefit Analysis of Regulations Ensures a Proper Balance Between a Strong Economy and Protecting Natural Resources

The "cost" portion of the cost-benefit pairing refers not just to monetary and opportunity costs incurred by regulatory agencies making a given decision, but also to the private economic costs that will result from a regulation. The burden the regulatory state imposed on the economy was the impetus for President Reagan's signing of the first executive order requiring cost-benefit analyses of government actions, Thomas O. McGarity, *Regulatory Reform in the Reagan Era*, 45 Md. L. Rev. 253 (1986), and similar economic concerns played a part in leading every president since then to "implement the same basic plan." Clowney, 18 Fordham Envtl. L. Rev. at 112. Because "[r]egulations aimed at protecting health, safety, and the environment alone cost over two hundred billion dollars annually–about two-thirds as much as outlays for federal, nondefense discretionary programs," government agencies now are to consider these "real costs to consumers as well as businesses," in their decision making. Robert W. Hahn, et al., *Assessing Regulatory Impact Analyses: The Failure of Agencies to Comply with Executive Order 12,866*, 23 Harv. J.L. & Pub. Pol'y 859, 859 (2000).

Cost-benefit analyses of environmental regulations, in contrast with decision-making frameworks such as the precautionary principle,

> plainly reflect compromises between the environment and other concerns. The commitment to environmental quality does not exist in a vacuum. . . . Indeed, an advocate might argue that this nation has expressed a commitment to private property rights that holds a far older provenance than the environmental commitment. The Constitution's proscription against government "taking" of private property without just compensation arguably is a plain explication of the history and strength of this commitment.

Boudreaux, 13 Tul. Envtl. L.J. at 147-48. This balancing goes back as far as the federal government's nascent entry into the environmental regulatory arena. *Id.* at n.42 (describing President Theodore Roosevelt's support for a dam in Yosemite National Park, over the objections of conservationists including John Muir, based on the need to "respond to human preferences").

"Expensive regulation may well increase prices, reduce wages, and increase unemployment (and hence poverty)." Hahn & Sunstein, 150 U. Pa. L. Rev. at 1493. "Almost all economic analyses (94 percent) note that a regulation will impose compliance costs on producers." Hahn, et al., 23 Harv. J.L. & Pub. Pol'y at 868. Therefore, it makes sense that when an agency aims to issue one of these regulations, it does so with evidence that its economic costs justify its proposed benefits. Unfortunately, the Office of Management and Budget has found that agencies are not always adhering to this principle. According to Hahn and Sunstein, one EPA landfill regulation evidences annual costs of $100 million, with no monetized benefits

whatsoever. 150 U. Pa. L. Rev. at 1491. Other federal environmental measures, ranging from certain chemical regulations to effluent and emissions standards, show similar, or worse, results. *Id.* at 1492. And it is important to note that these counterproductive regulations are being issued *with* the benefit of cost-benefit analysis, albeit analysis overlooked by final decision makers. It can only be presumed that such mistakes might be magnified in frequency and degree were the comparison of costs and benefits not carried out at all. Hahn, et al., 23 Harv. J.L. & Pub. Pol'y at 862 (studying widespread agency failure to conduct proper cost-benefit analyses and suggesting measures to correct the problem). In this case, where the costs of regulatory compliance are estimated by all parties to range far into the billions of dollars, *see, e.g.*, Petition of PSEG Fossil at 32-36, the EPA should be permitted to undertake a bona fide comparison of proposed benefits with these costs.

Cost-benefit analysis surely is made more complex when the proposed benefits are saved human lives, on which placing a monetized price is a facially controversial process. Sunstein, 99 Mich. L. Rev. at 1661. But regulatory analysts have been able to carry out their duties even when faced with the difficult question of quantifying the value of human life. Such comparison of costs and benefits is even more apt, then, where proposed benefits do not involve human lives (or even people's physical well-being) as is the setting of the present case.

C. Commitment to Cost-Benefit Analysis Makes Regulatory Agencies More Democratically Accountable

A less tangible, but by no means less important, feature of commitment to cost-benefit analysis is that it makes regulatory agencies more accountable to the American people. By increasing transparency in the decision-making process, and reducing the frequency of the kind of "intuitive" actions discussed above, voters can approach regaining some control over the behemoth regulatory apparatus that often impacts their lives more than any other arm of government. *See generally* McGarity, 45 Md. L. Rev. at 253-54.

"[F]ew look at [cost-benefit analysis's] role in an institutional context, that is, as a device whose justification depends on its capacity to help authoritative institutions such as Congress, the presidency, and the courts monitor subordinate institutions such as agencies." Posner, 68 U. Chi. L. Rev. at 1138. As Eric Posner writes, this ignoring of cost-benefit analysis's theoretical justifications likely is a side-effect of such analyses' practical ascendancy and popularity within government circles. *Id.* at 1140.

Posner addresses several arguments for cost-benefit analysis of regulations aside from the strictly consequentialist arguments outlined above. First, and most basically, he writes that agencies in their decision-making processes can make honest technical errors that lead to erroneous final results. *Id.* A public airing of the arithmetic, so to speak, via cost-benefit analysis can serve as a corrective to these understandable though undesirable mistakes.

More importantly, Posner notes that even a scientifically "perfect agency that makes no technical errors may implement projects that diverge from the goals of the President and Congress because the agency, or its chief, or its personnel, have their own divergent goals." *Id.* Such actions are, of course, an all-too-common feature of human nature, and of the regulatory process, and—as manifest in doctrines such as that of non-delegation—are not compatible with government accountable to the will of the governed. By making public not just the final product of the decision-making process, but the factors that lead to these ultimate decisions, the elected branches (and those who elect them) and the judiciary obtain more complete information by which to evaluate an agency's performance and discipline those performing poorly. *Id.* at 1142.

Government officials, though, are not the only parties who get a more transparent view of agency action through cost-benefit analysis. Individual citizens and interest groups affected by regulations also are signaled. "By forcing EPA to state clearly the effects of a regulation, it alerts affected groups, which frequently criticize EPA's estimates." Adler & Posner, 109 Yale L.J. at 175. This is important for two reasons. First, of course, it gives citizens more information on the rules by which they will be governed, and the rationales behind those rules. Aside from the benefits of a more informed populace, this affords affected individuals and groups a chance for input on these rules, if not via the labyrinth of the rulemaking itself then via their elected officials.

Second, it provides citizens with more opportunity to monitor these elected officials themselves, to ensure

that regulatory decisions made under their ultimate direction are aimed to "maximize efficiency" rather than merely to "transfer resources to interest groups." Posner, 68 U. Chi. L. Rev. at 1141. "Proponents of CBA argue that quantitative decision-making offers an antidote to the corruption. . . . Put simply, sunshine is the best disinfectant for the plague of agency quid pro quos." Clowney, 18 Fordham Envtl. L. Rev. at 118.

Thus, a regulatory commitment to cost-benefit analysis serves as a microcosm, of sorts, of the kind of checks and balances that animate our form of government. Elected officials and the judiciary may use the cost-benefit analyses to ensure that regulatory agencies are complying with legislative (and executive) priorities and controlling law, while citizens use this same information to hold both the agencies and their representatives accountable to their will. This theoretical justification for cost-benefit analysis, then, is as important, if not more so, than the normative public policy outcomes realized by comparing costs and benefits within the regulatory realm.

II

AMERICAN TEXTILE V. DONOVAN DOES NOT PRECLUDE THE EPA'S USE OF COST-BENEFIT ANALYSIS UNDER 33 U.S.C. § 1326(b)

In the opinion below, the Second Circuit addressed the question presented in this case by relying on this Court's decision in *American Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490 (1981). In *American Textile*, this Court addressed the propriety of cost-benefit analysis in a legal and factual setting distinct from that of the present case. Rather than

supporting the Second Circuit's holding, *American Textile* actually supports the validity of the EPA's use of cost-benefit analysis under the relevant provision of the Clean Water Act.

The court below cited *American Textile* for the proposition that

> "Congress itself defined the basic relationship between costs and benefits." *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 509, 101 S.Ct. 2478, 69 L.Ed2d 185 (1981). Moreover, this conclusion is further supported by the fact that Congress in establishing BTA did not expressly permit the agency to consider the relationship of a technology's cost to the level of reduction of adverse environmental impact it produces. "When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute."

Riverkeeper, Inc. v. EPA, 475 F.3d 83, 99 (2d Cir. 2007).

The Second Circuit thus interpreted *American Textile* as standing for the proposition that agencies need express authority to engage in cost-benefit analysis. This analysis is wrong, however, because this Court's *American Textile* opinion did not address an agency's *discretion* to engage in cost-benefit analysis, but whether the statute in that case (the Occupational Safety and Health Act) *required* the comparison of costs and benefits. *American Textile*, 452 U.S. at 506. No analogous issue is presented in the present case. The Second Circuit therefore erred in applying an opinion on an agency's *obligation* to

engage in cost-benefit analysis to a case involving the issue of an agency's discretion to do so. *Riverkeeper*, 475 F.3d at 99.

The court below was correct to note that this Court did not endorse cost-benefit analysis in *American Textile*. But, this holding stemmed not from the use of cost-benefit analysis in determining only the "best technology available," as is the situation in the present case, but instead resulted from Congress's instruction to OSHA that best available evidence be assured "to the extent feasible." *American Textile*, 452 U.S. at 508. This feasibility language is not found in the Clean Water Act provision at issue in the present case, and as this Court noted in *American Textile*, "all parties agree that the phrase 'to the extent feasible' contains the critical language." *Id.*

The feasibility language at issue in *American Textile* is important because the Second Circuit relied on that case for the proposition that "[c]ost-benefit analysis . . . is not permitted under [33 U.S.C. § 1326(b)] because . . . Congress has already specified the relationship between costs and benefits in requiring that the technology designated by the EPA to be the best available." *Riverkeeper*, 475 F.3d at 100 (citing *American Textile*, 452 U.S. at 509-10). By including the words "to the extent feasible,"

> Congress itself defined the basic relationship between costs and benefits, by placing the "benefit" of worker health above all considerations save those making attainment of this "benefit" unachievable. Any standard based on a balancing of costs and benefits by the

> Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in § 6(b)(5). Thus, cost-benefit analysis to OSHA is not required by the statute *because feasibility analysis is.*

Id. at 509 (emphasis added).

Thus, the Second Circuit's conclusion that the EPA "could not make the policy decision, in the face of Congress's determination that facilities use the best technology available, that an economically feasible level of reduction of impingement mortality and entrainment is not desirable in light of its cost," *Riverkeeper*, 475 F.3d at 100, is incorrect because feasibility analysis is not required under 33 U.S.C. § 1326(b). As *American Textile* indicates, feasibility analysis is a specific method that may be used in determining when evidence, technology, or any other agency tool is the "best available." 452 U.S. at 509.

The distinction between the analysis of feasibility and the comparison of costs and benefits is one recognized by legal academics as well. *See* Part I *supra*; Adler & Posner, 109 Yale L.J. at 168. Feasibility "requires regulators to set levels based on the capabilities of technology and to figure out the cost of employing the technology to evaluate whether the cost makes widespread plant closures unlikely." David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 B.C. Envtl. Aff. L. Rev. 1, 50 (2005). Cost-benefit analysis, on the other hand, "requires assessing the capabilities of technology in order to arrive at cost

estimates and to quantify the amount of reduction associated with that cost, the first step in arriving at a benefits estimate." *Id.* They are two different things, and opinions centered on one should not be imported into cases concerned with the other.

By including the word "feasible," Congress "defined the basic relationship between costs and benefits" under the Occupational Safety and Health Act. *American Textile*, 452 U.S. at 509. *See also* Driesen, 32 B.C. Envtl. Aff. L. Rev. at 10 ("Since principles of statutory interpretation preclude reading statutes to render any of their language superfluous, such as the language requiring 'feasible' measures, courts have understood the feasibility principle as contemplating some technological change that allows production of existing goods and services to continue."). With the absence of this language in 33 U.S.C. § 1326(b), the basic relationship between costs and benefits in determining "best technology available for minimizing adverse environmental impact" at cooling water intake structures is left undefined, and the EPA appropriately used cost-benefit analysis to fill the void. The court below erred in holding to the contrary.

CONCLUSION

For the reasons stated above, the judgment of the Second Circuit should be reversed.

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Respectfully submitted,

BRANDON M. MIDDLETON
Of Counsel
Pacific Legal Foundation
3900 Lennane Drive
Suite 200
Sacramento, California 95834
Telephone: (916) 419-7111
Facsimile: (916) 419-7747

M. REED HOPPER
*STEVEN GEOFFREY GIESELER
**Counsel of Record*
Pacific Legal Foundation
1002 SE Monterey Commons
Boulevard, Suite 102
Stuart, Florida 34996
Telephone: (772) 781-7787
Facsimile: (772) 781-7785

Counsel for Amicus Curiae
Pacific Legal Foundation

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ENTERGY CORPORATION, *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, *et al.*, *Respondents.*

PSEG FOSSIL LLC, *et al.*, *Petitioners,*

v.

RIVERKEEPER, INC., *et al.*, *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., *et al.*, *Respondents.*

On Writs Of Certiorari To The United States Court Of Appeals For The Second Circuit

AMICUS CURIAE BRIEF OF VOICES OF THE WETLANDS AND COASTAL ALLIANCE ON PLANT EXPANSION IN SUPPORT OF RESPONDENTS

DEBORAH A. SIVAS*
**Counsel of Record*
LEAH J. RUSSIN
ENVIRONMENTAL LAW CLINIC
MILLS LEGAL CLINIC AT
STANFORD LAW SCHOOL
559 Nathan Abbott Way
Stanford, California 94305-8610
(650) 723-0325
Attorneys for Amici Curiae

COCKLE LAW BRIEF PRINTING CO (800) 225-6964
OR CALL COLLECT (402) 342-2831

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Sebestián R. Rodriguez, F. Patricio Ojeda, & Nibalso C. Inestrosa, *Settlement of Benthic Marine Invertebrates*, 97 MARINE ECOLOGY PROG. SER. 193 (1993) 9

INTEREST OF *AMICI CURIAE*[1]

Amici curiae Voices of the Wetlands and Coastal Alliance on Plant Expansion are community-based non-profit organizations working to protect California's coastal ecosystems from the impacts of "once-through cooling" operations. Over the past several years, *Amici* have participated extensively in the Clean Water Act permitting processes for individual coastal power plants engaged in once-through cooling and have been active in ongoing state-level initiatives to address the impacts of such cooling systems on California's coastal resources. Voices of the Wetlands participated in the administrative process for the first major "repower" of a coastal electric generating facility, at Moss Landing, and subsequently litigated the interpretation of Section 316(b), including specifically the use of cost-benefit analysis. That case is now pending before the California Supreme Court. Coastal Alliance on Plant Expansion participated as a formally designated interested party in a multi-year administrative site license process before the California Energy Commission for the proposed repowering of the Morro Bay Power Plant and has closely followed the facility's intermittent Clean Water Act permitting and Section 316(b) compliance process

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[1] All parties have consented to the filing of this brief in letters that are on file with the Clerk. Pursuant to S. Ct. Rule 37.6, Counsel for *Amici* state that no counsel for a party authored this brief in whole or in part and no person or entity other than *Amici* or their counsel made a monetary contribution to the preparation or submission of this brief.

before the California Regional Water Quality Control Board for the Central Coast. Both organizations also have provided input to the California State Water Resources Control Board, the California State Lands Commission, and the California Ocean Protection Council as these agencies attempt to develop and promote more ecologically protective standards for cooling water systems used by California's large fleet of coastal power plants. Thus, *Amici* offer a unique citizen perspective on the implementation of Section 316(b) and the use of cost-benefit analysis in determining facility compliance along the California coast.

SUMMARY OF ARGUMENT

With over a thousand miles of vulnerable coastal habitat and an aging fleet of 21 coastal power plants, California has become a laboratory for implementing Section 316(b) of the Clean Water Act. As state regulators grapple with both individual facility permitting decisions and the development of comprehensive statewide guidance to protect coastal ecosystems, California has learned three valuable lessons. First, the State's large "once-through cooling" fleet takes a significant toll on California's coastal resources and has contributed to the precipitous decline in marine fish populations over the last several decades. Second, with careful planning, it is feasible to convert this obsolescent fleet to commercially-available alternative cooling

technologies as plants modernize and repower[2] over the next decade, without significantly impairing electricity grid reliability. And third, because the Environmental Protection Agency ("EPA") classifies even entirely new replacement power plants as "existing facilities," the cost-benefit exemption allowed by the Phase II Rule effectively negates the technology-forcing intent of Section 316(b). Thus, at least in California, there is no merit to the arguments, advanced by several briefs filed in this case, that site-specific cost-benefit analysis is necessary to keep the lights turned on or that such an approach is consistent with Congress' intent in crafting the Clean Water Act.

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[2] The California Energy Commission uses the term "repower" to mean the replacement of existing generating capacity with new generating facilities at the same site. In many cases, repowering along the California coast will involve total demolition of all existing structures and their replacement with state-of-the-art generating capacity. These old sites remain valuable, however, due to their location and existing connection to the electricity transmission system.

ARGUMENT

I. THE CONTINUED USE OF ONCE-THROUGH COOLING BY CALIFORNIA'S COASTAL POWER PLANT FLEET DEGRADES MARINE RESOURCES AND ESTUARINE ECOSYSTEMS.

The California coastline hosts 21 once-through cooling ("OTC") power plants with the capacity to use roughly 17 billion gallons of cooling water every single day.[3] The lead state agency involved in permitting power plants equates the use of such large volumes of water to a total habitat production loss of over 10,800 acres.[4] Cal. Energy Commission Staff Report,

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[3] Not all of these plants currently operate at full capacity, mostly due to market conditions and facility inefficiencies. *See* Cal. Ocean Protection Council, *California's Coastal Power Plants: Alternative Cooling System Analysis* ("*OPC Feasibility Study*") at 1-6 (2008), *available at* http://resources.ca.gov/copc/CCPP_ACSA.htm (noting that average age of fossil fuel facilities along the California coast is 40 years and explaining that due to inefficiencies, many of these plants are now used only for peak load demands). As discussed below, however, because there is a continuing need for local generation capacity in the highly populated coastal areas of California, many of these facilities have sought to repower by replacing their basic generating units with new infrastructure on the same site. Thus, while recent reductions in annual operating hours have somewhat reduced the environmental impacts of coastal OTC plants, the potential for ecological harm remains high as the fleet modernizes and repowers.

[4] Total habitat production loss is a measure that attempts to equate the ecological impacts of OTC intakes to an equivalent amount of habitat destruction in similar coastal estuaries. Thermal discharges from OTC plants, regulated under Section 316(a), also

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Issues and Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants ("*CEC 2005 Report*") at 30 (June 2005).[5] Most of California's OTC plants are located within bays and coastal estuaries, where impacts can be particularly severe due to the high biological productivity of these ecosystems and the concentration of OTC plants within them. Cal. Energy Commission Final Staff Report, *2007 Environmental Performance Report of California's Electrical Generation System* ("*CEC 2007 Report*") at 46-47 (Jan. 2008).[6]

Based on sporadic studies at individual power plants, the California State Water Resources Control Board ("State Water Board")[7] has very roughly estimated that

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have negative impacts on the coastal environment. In fact, researchers at Moss Landing Marine Labs have used the Diablo Canyon OTC outfall to examine how species composition changes in response to warming oceans and have found that there are statistically significant shifts in species abundance adjacent to the plant's thermal discharges. David R. Schiel, John R. Steinbeck, & Michael S. Foster, *Ten Years of Induced Ocean Warming Causes Comprehensive Changes in Marine Benthic Communities*, 85 ECOLOGY 1833, 1835 (2004).

[5] *Available at* http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013.PDF.

[6] *Available at* http://www.energy.ca.gov/2007publications/CEC-700-2007-016/CEC-700-2007-016-SF.PDF.

[7] The State Water Board sets water policy in California and, along with the nine Regional Water Quality Control Boards ("Regional Water Boards"), implements the federally delegated Clean Water Act program. In addition to ensuring compliance with Section 316(b) and issuing federal permits, the State and

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over 9 million organisms are impinged and 79 billion are entrained each year by California's coastal power plant fleet. Cal. State Water Resources Control Board, *Scoping Document: Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* ("*State Water Board Scoping Document*") at 12-16 (Mar. 2008).[8] These totals, moreover, very likely underestimate impacts by a significant amount because many existing monitoring studies only measured for particular commercially-valuable fish species, most did not measure for invertebrates (abalone, crab, etc.), and virtually none measured for phytoplankton (microscopic drifting plant species). Indeed, an independent technical study of how such impacts are assessed found that only seven of California's coastal power plants have even conducted entrainment studies using current, accepted scientific methods. *See* Cal. Energy Commission, Prepared by Moss Landing Marine Laboratories, *Understanding Entrainment at Coastal Power Plants: Informing a Program to Study Impacts and Their Reduction* ("*CEC Entrainment Study*") at 31 (2008).[9]

Both the State Water Board and the California Energy Commission have expressed concern over the

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Regional Water Boards also implement corresponding California state water protection laws.

[8] *Available at* http://www.waterboards.ca.gov/plans_policies/docs/coastal_estuarine/scope_doc031808.pdf.

[9] *Available at* http://www.energy.ca.gov/2007publications/CEC-500-2007-120/CEC-500-2007-120.PDF.

total number of fish killed by OTC power plants. In Southern California alone, fish mortality estimates range from 3.6 million fish per year for all 11 power plants in the region to 3.6 million fish per year just for the San Onofre Nuclear Generating Station. *Compare CEC 2007 Report*, *supra*, at 47 *with State Water Board Scoping Document, supra,* at 13. This mortality represents somewhere between 8 and 30 percent of the total catch from all recreational fishing activity in the Southern California study area. *CEC 2007 Report*, *supra*, at 47. While the raw numbers are themselves alarming, the discrepancy between them is even more troubling. Without significantly more accurate and verified fish mortality data, state permit writers cannot possibly understand fish mortality impacts or, by extension, begin to monetize them in a cost-benefit analysis.

We have even less data for plankton – tiny, drifting plants and animals that form the basis of marine food webs. While some monitoring studies measure certain fish larvae and, on occasion, some invertebrate larvae, the entrainment of many zooplankton (animal species) and virtually all phytoplankton (plant species) is simply uncounted. Yet, the loss of trillions of plankton unquestionably impairs ecosystem functioning. Marine phytoplankton account for over 99 percent of the primary energy production in marine ecosystems and play an essential role in transferring this energy up the food web to

larger animals.[10] Reductions in plankton abundance can, therefore, have cascading effects through marine food webs, as planktonic prey become scarcer, and such cascading effects have been a scientific concern in California for decades.[11] For this reason, the true effects of OTC systems on marine ecosystems – and the benefits of converting power plants to an alternative cooling system – cannot be measured without a much better understanding of how plankton are impacted.

Although OTC systems are indiscriminant killers, the effects on already-imperiled species are particularly problematic. *See CEC 2005 Report*, *supra*, at 32. Consider, for example, California abalone, which are an important part of the state's ecological and social heritage and are in serious decline. The white abalone is listed as endangered under federal law, the black abalone is proposed for listing, and the green and pink abalone are considered "species of concern."[12] Like many other marine species, abalone are broadcast spawners, meaning that they reproduce by casting eggs and sperm into

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[10] *See* MARK DENNY, HOW THE OCEAN WORKS: AN INTRODUCTION TO OCEANOGRAPHY, Princeton Univ. Press (2008) at 69-79, 124-28.

[11] *Id. See also* F. J.-P. Briand, *Effects of Power Plant Cooling Systems on Marine Phytoplankton*, 33 MARINE BIOLOGY 135, 143 (1975).

[12] 66 Fed. Reg. 29,046 (May 29, 2001) (white abalone); 73 Fed. Reg. 1,986 (Jan. 1, 2008) (black abalone); 69 Fed. Reg. 19,974, 19,977 (Apr. 15, 2004) (green and pink abalone).

the water where they are fertilized and develop into free-swimming larvae. These larvae will ultimately settle and become stationary adults. Abalone must maintain a sufficient density of spawning adults for reproduction to occur.[13] Abalone, like most marine larvae, are not strong swimmers, and thus depend on currents to move them toward favorable settlement locations.[14] But when abalone spawn near OTC plants, they are drawn by intake currents toward and into the plant, where they are unable to survive the extreme temperatures of the cooling process. In this way, OTC intake systems not only reduce the number of juvenile abalone, but also decrease the density of individuals near power plant intake structures and thereby have particularly detrimental impacts on future reproductive success and survival.

The abalone story is but one among many impacts from OTC plants that are not captured by current scientific monitoring and modeling. As scientists at the Moss Landing Marine Laboratories have explained: "Smaller larvae (other invertebrates)

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[13] *See* Alistair J. Hobday, Mia J. Tenger, & Peter L. Haaker, *Over-Exploitation of a Broadcast Spawning Marine Invertebrate: Decline of the White Abalone*, 10 REV. IN FISH BIOLOGY & FISHERIES 493, 494 (2001).

[14] Sebestián R. Rodriguez, F. Patricio Ojeda, & Nibalso C. Inestrosa, *Settlement of Benthic Marine Invertebrates*, 97 MARINE ECOLOGY PROG. SER. 193, 198 (1993).

typically cannot be identified with existing methods, even though their populations are likely effected [sic]. Planktonic invertebrates and phytoplankton are typically not sampled because of their excessively small sizes and the commonly held assumptions that their rapid growth and fast population turnover suggest that ecological impacts are unlikely, although this has not been studied." *CEC Entrainment Study*, *supra*, at 15. In the absence of even basic knowledge about how OTC systems affect the fundamental building blocks of marine ecosystems, any regulatory weighing of costs against benefits is more fiction than reality.

OTC plants also harm species at the other end of the size spectrum, including California harbor seals, elephant seals, and California sea lions, all of which are protected under the Marine Mammal Protection Act, 16 U.S.C. §§ 1361-1423. After years of denying impacts to marine mammals, 13 coastal power plants in Central and Southern California applied this year for permits to "incidentally" harm or kill these species in their OTC systems. 73 Fed. Reg. 2,999 (Feb. 12, 2008). In doing so, the power plants conceded that seals and sea lions can become entrained in power plant intake structures and die of stress or suffocation before plant operators are able to release them. *Id.* In fact, the Marine Mammal Stranding Network, a group of scientists affiliated with the National Oceanic and Atmospheric Administration, estimates that 23 harbor seals died as a result of power plant

entrainment between 1999 and 2003 and that 21 sea lion were killed from entrainment in 2001 alone.[15] California estimates annual impingement of marine tetrapods (seals, sea lions, and sea turtles) at 57 animals, the vast majority of which are killed. *State Water Board Scoping Document*, *supra*, at 16.

In short, as the California Energy Commission staff explained in its recent report on OTC facilities: "Coastal power plants are partly responsible for ocean degradation. Recent studies required by the California Energy Commission and other State agencies have shown that coastal power plants that use seawater for once-through cooling are contributing to declining fisheries and the degradation of estuaries, bay[s] and coastal waters." *CEC 2005 Report, supra,* at 1.

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[15] *See*, National Marine Fisheries Service, *Harbor Seal (Phoca vitulina richardsi): California Stock* at 3 (2005); National Marine Fisheries Service, *California Sea Lion (Zalophus californianus californianus): U.S. Stock* at 3 (2003).

II. IN ATTEMPTING TO DEVELOP MORE ENVIRONMENTALLY PROTECTIVE STATEWIDE GUIDANCE FOR EXISTING OTC PLANTS, CALIFORNIA HAS CONCLUDED THAT COASTAL FACILITIES CAN UPGRADE TO ALTERNATIVE COOLING SYSTEMS WITHOUT SUBSTANTIALLY IMPAIRING ELECTRICITY GRID RELIABILITY.

A. California Is Developing a More Protective State Policy that Does Not Allow for Cost-Benefit Exemptions from Performance Standards.

Faced with the substantial environmental impacts caused by California's OTC fleet, several state agencies are pressing for greater ecological protection. For instance, after concluding that "California marine and estuarine environments are in decline and the once-through cooling systems of coastal power plants are contributing to the degradation of our coastal waters," the staff of the California Energy Commission recommended, among other things, that the Commission develop new siting policies and create incentives to promote alternative cooling systems. *CEC 2005 Report* at 1, 4-6. Soon thereafter, the California State Lands Commission, which exercises leasing jurisdiction over state tidelands, adopted a resolution recognizing that once-through cooling "significantly harms the environment by killing large numbers of fish and other wildlife, larvae and eggs, . . . by raising the temperature of the receiving

waters, and by killing and displacing wildlife and plant life." *Resolution by the California State Lands Commission Regarding Once-Through Cooling in California Power Plants* (Apr. 17, 2006).[16] Accordingly, the Lands Commission urged its sister agencies "to expeditiously develop and implement policies that eliminate the impacts of once-through cooling on the environment, from all new and existing power plants in California" and resolved not to approve or extend any tideland leases for power plants unless the plant complies with all state and federal requirements for minimizing the impacts of cooling water systems. *Id.* The California Ocean Protection Council quickly followed suit with a similar resolution acknowledging the "multiple types of undesirable and unacceptable environmental impacts associated with once-through cooling technology" and urging, among other things, that the State Water Board implement more stringent state standards to reduce impacts from power plant cooling systems. *Resolution of the California Ocean Protection Council Regarding the Use of Once-Through Cooling Technologies in Coastal Waters* (Apr. 20, 2006).[17]

Responding to this call for action, the State Water Board in June 2006 proposed new, more stringent statewide regulations for power plant cooling systems. Following EPA's suspension of the Phase II

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[16] *Available at* http//www.cacoastkeeper.org/assets/pdf/SLC_Resolution_OTC.pdf.

[17] *Available at* http://resources.ca.gov/copc/.

Rule in 2007, the State Water Board issued a revised draft statewide policy, the express intent of which is to "ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met." *State Water Board Scoping Document, supra*, at 83-91.[18] Similar to the federal Phase I Rule, California's draft policy provides for compliance via one of two "tracks." The default track requires a reduction in intake flow and velocity "at a minimum, to a level commensurate with that which can be attained by a closed-cycle cooling system." *Id.* at 84. Where the plant owner demonstrates that it is not feasible to comply with the first track, the draft policy requires compliance using operational or structural controls that reduce impingement mortality and entrainment of all stages of marine life by at least 90 percent of the reduction that would be achieved using a closed-cycle cooling system. *Id.* Significantly, the proposed California policy does not allow for any exemption from these standards based on the weighing of compliance costs against environmental benefits.

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[18] The draft state policy focuses on existing power plants because the State Water Board recognizes, for the reasons explained below, that no new power plants will be sited along the California coast. Due to market conditions and the age of the fleet, most or all existing coastal plants will be either repowered or mothballed over the next several years.

B. Inefficient Physical Plant and Market Forces Are Driving the OTC Fleet to Modernize and Repower, Providing an Ideal Opportunity to Upgrade these Sites to More Environmentally Sound Cooling Systems.

California's coastal OTC fleet is in the midst of modernizing, as plant owners gradually replace old generation facilities with more efficient combined-cycle generating capacity. This modernization trend provides the state with an important opportunity to increase power plant efficiency and move away from the use of OTC. Cal. Energy Commission, *Comments on SWRCB Scoping Document and Proposed Statewide Policy on Clean Water Act State Water Resources Control Board* at 7 (Sept. 26, 2006).[19] In fact, the Energy Commission has adopted an affirmative policy to encourage the orderly retirement of aging, inefficient coastal power plants and their replacement with modern, efficient combined-cycle or peaking facilities by the year 2012. *Id.* at 2. The California Ocean Protection Council similarly has concluded that "[r]epowering is of particular interest in California, where many of the coastal power plants 30 to 40 years old, or more, and are likely to be replaced with more efficient technologies in the coming years." *OPC Feasibility Study, supra,* at ES-1. In short, newer, more efficient generation capacity is coming

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[19] *Available at* http://www.energy.ca.gov/siting/documents/2006-09-25_LETTER_TO_SWRCB.PDF.

quickly in California, and much of it will be installed at existing OTC power plant sites as a result of state incentives that prioritize these coastal facilities for repowering. *See* Cal. Pub. Util. Code § 454.6.

Recent OTC plant repowering decisions illustrate that the economics of modernizing with an alternative cooling system are not prohibitive as long as appropriate regulatory incentives are in place. Since electricity market deregulation in the late 1990's, six large California coastal plants have applied to repower by retiring and replacing old steam boilers. *CEC 2007 Report*, *supra*, at 17. Five of these facilities (Moss Landing, Morro Bay, El Segundo, Huntington Beach, and Gateway) sought approval soon after the turn of the century, each proposing to use OTC for their new generating units. Following issuance of the Second Circuit's decision at issue here, the El Segundo and Gateway facilities sought to amend their licenses to switch to alternative cooling technologies. Having watched the Phase II Rule unfold in the courts, subsequent applicants for repowering have all proposed to use alternative cooling systems. *See id.* at 56-57. Thus, faced with a judicial interpretation of the Clean Water Act that does not allow for a cost-benefit exemption to national performance standards, aging California OTC plants have begun to move toward full compliance with Section 316(b)'s "best technology" requirement. In doing so, they are falling in line with new inland power plants that do not have

a ready source of free, cold water for cooling. *See id.* at 39 (noting that proposals to use air cooling for new power plants across the state increased significantly in 2006 and 2007).

Moreover, a detailed study prepared by technical consultants for the Ocean Protection Council and the State Water Board concluded that implementation of a more protective state policy without the cost-benefit loophole contained in the Phase II Rule would not significantly affect electricity grid reliability in California. The authors first explained that mass retirements of OTC plants in response to the proposed state rule are "highly unlikely" for several reasons:

> Older plant owners have many incentives for repowering, including provisions in state law and regulation that essentially give preference to repowered coastal plants in the utility power contracting process. They also have ready availability of natural gas and transmission infrastructure at the present site, and the efficiency improvement offered by new plant technologies will greatly improve their ability to compete with other resources.

Cal. Ocean Protection Council and State Water Resources Control Board, *Electric Grid Reliability Impacts from Once-Through Cooling in California*

("*Grid Reliability Study*") at 3-4 (2008).[20] Based on computer modeling, the authors then determined that the repowering of old steam plants and the conversion of combined-cycle plants to alternative cooling systems is cost-effective and, with proper planning and phasing of upgrades, can be achieved without significantly affecting reliability of the electricity grid. *Id.* at 4-5, 55-57.

A separate report prepared for the Ocean Protection Council reached a similar conclusion. That study examined the technical, logistical, and regulatory feasibility of converting the remaining active OTC plants along the California coast to closed-cycle wet recirculation cooling, concluding that such a conversion was feasible for all but 3 of these facilities,[21] where technical constraints may impede the use of cooling towers and require the installation of other technologies. *See OPC Feasibility Study*, *supra*, at ES-1 to ES-10. Cost modeling indicates that, at worst, the retrofitting of existing (unrepowered) facilities would add 1.13 cents per kilowatt hour to retail electricity rates. *Id.* at ES-9. Repowered facilities

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[20] *Available at* http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/power_plant_cooling/reliability_study.pdf.

[21] Although there are 21 OTC plants along the California coast, 3 of these have effectively stopped operating. Two of the remaining 18 facilities have already committed to closed-cycle cooling and one is preparing to close permanently for other reasons. Thus, the feasibility study focused on the remaining 15 active facilities.

would, of course, enjoy increased efficiencies and lower cost impacts.

Thus, while existing OTC plants play an important role in providing power to so-called "local reliability areas" along the California coast, these facilities can be converted to alternative cooling technologies without major economic dislocation or disruption of the electricity transmission system. Extensive study of this issue in California demonstrates that what is needed for an orderly conversion, as the OTC fleet inevitability modernizes to compete in the contemporary energy market, is proper planning and regulatory signals, not wholesale exemption from Section 316(b)'s best technology-based performance standards.

II. EPA'S ALLOWANCE OF SITE-SPECIFIC COST-BENEFIT EXEMPTIONS UNDERMINES THE INTENT OF SECTION 316(b) AND WILL SET BACK CALIFORNIA'S EFFORTS TO ENCOURAGE INSTALLATION OF AVAILABLE ALTERNATIVE COOLING TECHNOLOGY AS THE OTC FLEET MODERNIZES.

Recent regulatory developments – including importantly the Second Circuit's affirmation that cost-benefit exemptions from national performance standards are not available under Section 316(b) – have set the stage in California for precisely the kind of technological advances that Congress envisioned when it enacted the Clean Water Act. Yet, two of the

first repowering decisions for the state's aging coastal OTC fleet illustrate just how easily a site-specific cost-benefit exemption can be manipulated to avoid the installation of the best technology available even at entirely new generating facilities. Neither congressional intent nor public policy considerations support the creation of such a major hole in the statutory fabric.

A. Cost-Benefit Exemptions Not Only Are Unwarranted, But Also Send the Wrong Regulatory Signal to Existing Facilities Contemplating Necessary Upgrades.

As the D.C. Circuit has explained, "the most salient characteristic of [the Clean Water Act] statutory scheme, articulated time and again by its architects and embedded in the statutory language, is that it is technology-forcing." *Natural Resources Defense Council, Inc. v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) (citing relevant legislative history). Indeed, "[t]he essential purpose" of the statute's "progressively more demanding technology-based standards was not only to stimulate but to press development of new, more efficient and effective technologies. This policy is expressed as a statutory mandate, not simply as a goal." *Id.* at 124. To effectuate this purpose, Congress expressly used the phrase "best technology available" in Section 316(b), just as it intentionally used similar language in other technology-forcing provisions of the statute, "to reflect the need to press

for increasingly higher levels of control." *See Tanner's Council of America, Inc. v. Train*, 540 F.2d 1188, 1195 (4th Cir. 1976).

In California, the use of site-specific cost-benefit exemptions will directly undermine the technology-forcing intent of Section 316(b). By bifurcating the Section 316(b) implementing regulations into distinct phases – a bifurcation that does not exist in the statute itself – and then broadly defining "existing facilities" to include brand new, more efficient generating capacity at existing power sites, EPA has virtually guaranteed that every single OTC replacement plant along the California coast will fall within the Phase II Rule and its provisions for a cost-benefit exemption, an exemption that is not available to "new facilities" under the Phase I Rule.[22] But the proffered

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[22] As EPA explained in the preamble of the final Phase II Rule, "existing facilities" are broadly defined to include "the addition of new generating units at the same site, even where they require[ ] an increase in cooling water intake structure design capacity or the construction of a new cooling water intake structure, *as well as the complete demolition of an existing facility and its replacement with a new facility*, so long as it [does] not increase the design capacity of the cooling water intake structure." 69 Fed. Reg. 41,576, 41,579 (July 9, 2004) (emphasis added). This definition stands in stark contrast to EPA's definition of "new source" under Sections 306 and 402 of the Clean Water Act: "[M]ajor modifications to existing facilities . . . would be 'new sources' in 40 CFR 122.29 as that term is used in the effluent guidelines and standards program." 66 Fed. Reg. 65,256. *See also* 40 C.F.R. § 122.29(b)(1); 122.22. High land values along the California coast ensure that no electric generating plants will be constructed on entirely new sites to serve

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public policy justification for reading a cost-benefit exemption into the law for existing facilities – higher retrofit costs – does not actually apply here.[23] Coastal replacement plants face essentially the same construction cost structure and the same market conditions as do new "greenfield"[24] facilities located elsewhere. If anything, coastal replacement plants are financially advantaged over their inland counterparts by both special state incentives for repowering and the

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these high population, high energy demand areas. Instead, all new coastal facilities will be constructed on existing power plant sites and will, therefore, be able to avail themselves of the "existing facility" classification.

[23] EPA invoked as its primary justification the potential for higher costs when retrofitting existing "Phase II" facilities, as compared to the construction of new "greenfield" facilities:

> [The Phase I rule] does not apply to existing facilities . . . [because] existing facilities might incur higher compliance costs than new facilities. For example, existing facilities might need to upgrade or modify existing intake structures and cooling water systems to meet requirements of the type contained in today's rule, which might impose greater costs than use of the same technologies at a new facility. Retrofitting technologies at an existing facility might also require shutdown periods during which the facility would lose both production and revenues, and certain retrofits could decrease the thermal efficiency of an electric generating facility.

66 Fed. Reg. 65,256 (Dec. 18, 2001).

[24] In describing the Section 316(b) regulations, EPA used the term "greenfield facility" to mean "a facility that is constructed at a site at which no other source is located or that totally replaces the process or production equipment at an existing facility," including the cooling water intake structure. 69 Fed. Reg. 41,576, 41,578 (July 9, 2004).

absence of new land purchase costs. Competing inland facilities, however, do not enjoy the public subsidy of free cooling water and, as a result, generally do not engage in the ecologically destructive practice of OTC. By reading a cost-benefit exemption into Section 316(b), EPA has adopted a regulatory policy that favors one set of plant operators over another and will perpetuate the use of outmoded cooling technology for generations to come, at the direct expense of California's dwindling fisheries and other public trust resources.

EPA's approach undercuts California's slow but steady progress toward the conversion of OTC facilities to alternative cooling technologies. Following electricity deregulation in California, the first several coastal power plants to complete the repowering approval process predated the Second Circuit's decision in this case and each received approval to utilize OTC. *Grid Reliability Study*, *supra*, at Table 1-1. As illustrated by the Moss Landing and Morro Bay examples below, these regulatory approvals relied, in large part, upon an agency determination that the economic costs of compliance outweighed the environmental benefits. Following issuance of the Second Circuit decision disallowing the use of cost-benefit analysis, the owners of the as-yet-unconstructed El Segundo and Gateway facilities sought to amend their regulatory approvals to permit the use of dry cooling technology instead of OTC. *Id.*; *CEC 2007 Report*, *supra*, at 56-57. Reversal of the Second Circuit decision by this Court will send a conflicting

signal to these and other facilities, cutting sharply against California's announced policy of converting OTC facilities to environmentally superior cooling technologies as they move through the repermitting and repowering process.

B. Recent Permitting Decisions in California Demonstrate that the Technology-Forcing Requirements of Section 316(b) Can Be Easily Circumvented Through the Application of Dubious Cost-Benefit Analysis.

The Moss Landing Power Plant approval process provides a window into how individual repower permit decisions are likely to implement the cost-benefit exemption contained in the Phase II Rule, if it is allowed to stand. In the first major repowering project at a coastal OTC plant, the Moss Landing facility sought to replace five inefficient operating units constructed in the 1950's with two new state-of-the-art combined-cycle natural gas-fired generating units, at an estimated capital cost of $475 million. Cal. Energy Commission, *Commission Decision on Application for Certification, Moss Landing Power Plant Project,* Docket No. 99-AFC-4 at 2 (Nov. 2000).[25] The Moss Landing plant is located at the mouth of

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[25] *Available at* http://www.energy.ca.gov/sitingcases/mosslanding/documents/index.html#commission.

Elkhorn Slough, an acknowledged "biological gem" that provides habitat for hundreds of bird, fish and invertebrate species and serves as an important nursery for the ecologically renowned Monterey Bay. Cal. Energy Commission, *Biological Resources Errata to Final Staff Assessment* ("*Biological Errata*") at 7 (June 19, 2000).[26] Operation of the plant's OTC system, which has the capacity to withdraw 1.224 billion gallons of water a day from the estuary, entrains roughly 28 percent of the slough's total water volume every single day and results in the destruction of all living matter contained therein. The resulting 13 percent continuous loss in biological productivity is considered to be ecologically "significant" by state agency biologists. *Id.* at 10-11.

In issuing a new Clean Water Act permit for the repowered Moss Landing facility, the Regional Water Board, as the delegated state permitting agency, employed a site-specific cost-benefit analysis to evaluate compliance with Section 316(b) and determined that an alternative closed-cycle cooling system for the new generating units would add $12-13 million to the cost of construction. *Voices of the Wetlands v. Cal. State Water Resources Control Board*, 69 Cal. Rptr. 2d 487, 524 n.7, 528 (2007), *rev. granted*, 74 Cal. Rptr. 3d 453 (2008). State regulators attempted to monetize the environmental benefits of such an

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[26] *Available at* http://www.energy.ca.gov/sitingcases/mosslanding/documents/index.html#commission.

alternative cooling system using a controversial "habitat equivalency" conversion method and arrived at an environmental benefit value of between $4.68 and $9.75 million. *See Biological Errata, supra*, at 13. Regional Water Board staff then utilized these monetary estimates to weigh the estimated incremental costs ($12 to $13 million) against the estimated incremental benefits ($4.68 to $9.75 million) and concluded that the cost of installing commercially-available alternative closed-cycle wet cooling technology was not justified by – in fact, in staff's view, was "wholly disproportionate" to – its environmental benefit. Thus, the Regional Board ultimately approved a new Clean Water Act permit that allowed the repowered facility units to be designed, constructed, and operated using an old-fashioned OTC system. Today, the Moss Landing facility stands as California's flagship natural gas-fired electric generating plant, running at significantly increased efficiency and generating substantial profits for its private owner, even as its highly damaging OTC system continues to degrade Elkhorn Slough and the public resources of Monterey Bay into the indefinite future.

A similar fate awaits the estuary just down the coast at Morro Bay. There, the plant owner has proposed – and the California Energy Commission has preliminarily approved – a repower project that will involve (1) the construction of an entirely new, modern combined-cycle generating facility adjacent to the existing plant and (2) the subsequent demolition of the existing structure. The sole connection between

the two parts of this repower project is a water intake pipe running from the old cement cooling water intake structure located on the public tidelands, across the site, to the newly constructed facility. *See* Cal. Energy Commission, *3rd Revised Presiding Member's Proposed Decision for Morro Bay Power Plant Project,* Docket No. 00-AFC-12 at 2 (June 2004).[27] Although the plant owner has elected to continue operating, for now, pursuant to a long-term administrative extension of its 1995 permit and has not yet sought final project approval from state regulators, the Regional Board has issued a draft Clean Water Act permit document that mimics the cost-benefit approach utilized for the Moss Landing facility. At Morro Bay, the Regional Board calculated a 33 percent larval loss from operating an OTC system at the new facility, on which it placed a monetary value of $28 million using the same dubious "habitat equivalency" approach employed at Moss Landing. *See* Cal. Regional Water Quality Control Board, *Draft Waste Discharge Requirements Order No. R3-2004-0023, NPDES Permit No. CA 0050610, Attachment 3*, at 2 (Dec. 2, 2004).[28] Because the least expensive alternative cooling water technology is estimated to cost $30 million, *id.* at 4,[29] the draft

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[27] *Available at* http://www.energy.ca.gov/sitingcases/morrobay/documents/index.html#commission.

[28] *Available at* http://www.swrcb.ca.gov/rwqcb3/Facilities/DukeEnergy/DukeMB.htm.

[29] The incremental cost of this alternative closed-cycle technology vis-a-vis once-through cooling technology is not

(Continued on following page)

permit proposes to allow the new facility to be designed and operated using an OTC system. *Id.* at 8.

These leading examples – and undoubtedly there will be more to follow if the Second Circuit decision is reversed – demonstrate how state permit writers will interpret and implement the Phase II cost-benefit exemption as California's power industry moves to modernize and repower its highly inefficient OTC fleet over the next several years. Despite a perfect market opportunity to install the best cooling technology available as part of the massive power plant modernization effort along California's ecologically embattled coastline, plant owners may use the regulatory loophole of site-specific cost-benefit exemptions to circumvent national technology standards. The result could well be a series of new, more efficient and more profitable electric generating units that nonetheless employ outmoded cooling water systems which are significantly less protective than the "best technology available" on the market, further jeopardizing the living marine resources that undergird California's vast coastal economy. Because EPA has already taken account of cost-effectiveness in setting uniform performance standards, there is no legitimate policy rationale for permit writing agencies or the Court to override the clear intent of Congress by allowing such

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disclosed in the Regional Water Board documents, but it obviously is less than $30 million and more likely on the order of the $12 to $13 million incremental cost estimate at sister facility Moss Landing.

upgraded or newly constructed facilities to evade the installation of commercially available, environmentally superior cooling system technologies.

CONCLUSION

For the foregoing reasons, and the reasons set forth in Respondents' and other supporting *amicus* briefs, the decision of the Second Circuit in this case should be affirmed.

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DEBORAH A. SIVAS*
ENVIRONMENTAL LAW CLINIC
MILLS LEGAL CLINIC AT
STANFORD LAW SCHOOL
Crown Quadrangle
559 Nathan Abbott Way
Stanford, California 94305
(650) 723-0325

**Counsel of Record*